

Dwarf acaulescent herb, forming tufts; leaves rosulate, linear, 1--2 mm. long, glabrous, shiny, apiculate at the apex, with a very dense and conspicuous cushion of white wool at the center of the rosette; sheath closely appressed, 5--7 mm. long, gray, thin-membranous, many-striate, slightly twisted, glabrous, its rim oblique, not at all spreading, somewhat laciniate, not pilose; peduncles solitary, 2.5--3 cm. long, erect, very slender or filiform, loosely long-pilose, 3-angled, slightly twisted; heads solitary, subglobose, 3--4 mm. long and wide, gray; involucre bractlets membranous or subhyaline, lanceolate, about 1 mm. long, aristate at the apex, broadly white-margined, with a dark central midrib leading into the apical point, glabrous on both surfaces; receptacle pilose.

The type of this very distinct and unmistakable species was collected by Bassett Maguire, Geraldo Mendes Magalhães, and Celia K. Maguire (no. 49183), occasional on sandstone on the road between Diamantina and Gouveia, Minas Gerais, Brazil, on August 12, 1960, and is deposited in the Britton Herbarium at the New York Botanical Garden.

SYNGONANTHUS KERANTHEMOIDES var. GRAHAMAE Moldenke, var. nov.

Haec varietas a forma typica speciei foliis tenuiter chartaceis submembranaceis flaccidis 5--9 cm. longis 0.5--2 mm. latis ad apicem attenuatis recedit.

This variety differs from the typical form of the species in having its leaves during anthesis thin-chartaceous or submembranous, flaccid, 5--9 cm. long, 0.5--2 mm. wide, and gradually narrowed to the attenuate apex.

The type of the variety was collected by V. Graham (no. 154) -- in whose honor it is named -- on brown sand at the Mahdia goldfield, Potaro River, British Guiana, on July 31, 1958, and is deposited in the herbarium of the Royal Botanic Gardens at Kew.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. VII

Harold N. Moldenke

VERBENA L.

Additional and emended bibliography: Leche, Kongl. Svensk. Vetensk. Acad. Handl. 5: 262. 1744; J. A. Murr., Prod. Desig. Stirp. Gotting. 40. 1770; C. Murr., Brit. Gard. 2: 478--480. 1799; Spreng. in L., Syst. Veg., ed. 16, 2: 749 & 750. 1825; Lindl. in Edwards, Bot. Reg. 13: pl. 1102 (1827) and 14: pl. 1184. 1828; Reider, Ann. Blumisterei 7: 288--289, 291, & 295, [pl. 24]. 1831; J. Harrison, Floricult. Cab. 6: 47. 1838; Maund & Henslow, Botanist 2: pl. 60 (1838) and 3: pl. 129. 1839; Gard. Chron. 1841: 730. 1841; Gren. & Godr., Fl. Franç. 2: 718. 1852; Strobl, Flora van Admont, Programme des Melker Gymnasium. 1882; F. Muell., Syst. Cens. Aust. Pl. 102.

1882; J. Ball, Notes Naturalist 293. 1887; F. M. Bailey, Cat. Indig. Nat. Pl. Queensl. 35. 1890; Murr, Deutsch. Bot. Monatschr. 20: 52. 1902; L. H. Bailey, Cycl. Amer. Hort., ed. 1, 6: 1912--1916, pl. 2649 (1902) and ed. 4, 6: 1912--1916, pl. 2649. 1906; Fedde in Just, Bot. Jahresber. 33 (1): 632--633. 1906; E. H. L. Krause in Sturm, Fl. Deutschl. 15: 305. 1907; Murr, Allg. Bot. Zeitschr. 14: 19 (1908) and 16: 187. 1910; Druce, Rep. Bot. Exch. Club Brit. Isles 1913 (3): 425. 1914; L. H. Bailey, Stand. Cycl. Hort. 6: 3445--3447, pl. 3910. 1917; Molfino, Physis 7: 103. 1923; Britton & P. Wils., Scient. Surv. Porto Rico 6: 137, 138, 140, & 142--144. 1925; Larraff., Atlas Bot. pl. 42. 1927; Gonzalez, Copp., & Lomb., Pl. Diaph. Fl. Urug. 1: 9 & 29--30. 1928; H. F. Roberts, Pl. Hybrid. before Mendel 24--28, pl. 17 & 18. 1929; Herter, Estud. Bot. Reg. Urug. 8b: 160, 170, & 201. 1933; Parodi, Rev. Argent. Agron. 1: 202. 1934; T. Meyer, Memor. Comis. Invest. Lang. Correspond. 1934: 154. 1934; Gard. Chron., ser. 3, 101: 423. 1937; Florists Exch. 89 (3): 45. 1937; M. R. Espinosa Bustos, Rivadavia 327. 1938; N. Y. Times, March 12. 1939; Beale, Chron. Bot. 5: 517. 1939; Balls, Gard. Chron. Amer. 45: 36. 1941; Descole, Gen. & Sp. Pl. Argent. 2: Icon. Pl. Argent. pl. 165. 1944; Cabrera, DAGI Pub. Tec. 3: 27, 38, 45, & 75. 1945; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 55: 56. 1946; Martinez Crovetto & Piccinini, Revist. Investig. Agric. 4: 178, 180, 225, & 226. 1950; Politi, The Garden 2 (4): 22. 1950; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208--2213. 1951; Lombardo, Invent. Pl. Cult. Montevideo 222, 232, 248, & 262. 1954; Free, All About Peren. Gard. 116 & 352. 1955; Rambo, Sellowia 7: 260 & 288. 1956; Soukup, Biota 1: 180--181. 1956; J. & L. Bush-Brown, Am. Gard. Book, new rev. ed., 315, 327, & 383. 1958; Kunkel, Ber. Schweiz. Bot. Gesell. 71: 177. 1961; Lombardo, Arbust. & Arbustill. Pas. Publ. 255. 1961; Assoc. Etud. Tax. Fl. Afr. Trop. Index 1961: 60. 1962; McCabe, Our Parks 28 (1): 1. 1962; H. N. Moldenke, Résumé Suppl. 4: 1--21 (1962) and 5: 1--8. 1962; Pearce Seeds & Plants, Our Am. Wild Fls. 10. 1962.

An additional named hybrid is

Verbena mendocina R. A. Phil. x V. parodii (Covas & Schnack) Moldenke = xV. perturbata Moldenke

An additional unidentified name is

Verbena peruana, quae hispanicae similis, ex Monardi, Lugdenensis referet C. Bauh., Pinax Theatr. Bot., ed. 1, 269. 1623.

It is of interest to note that "Verbena" is now being used as the name of a color (of blankets offered by John Wanamaker, Philadelphia, in 1962). The Waterfall & Wallis 13476, distributed as a species of Verbena, is actually Priva grandiflora (Ort.) Moldenke.

VERBENA ABRAMSI Moldenke

Additional bibliography: Moldenke, Résumé Suppl. 4: 4. 1962.

The Wilkes 1661 collection cited below is a mixture with V. lasiostachys var. septentrionalis Moldenke.

Additional citations: CALIFORNIA: Kings Co.: Kearney 56 (W--

410850). Los Angeles Co.: Abrams & McGregor 689 (W--613394); Braunton 520 (W--465502). Monterey Co.: G. R. Vasey s.n. [San Antonio River, 1880] (W--56224). San Bernardino Co.: Parish & Parish 969 (W--771849). County undetermined: Wilkes 1661, in part [Lower Sacramento] (W--71925).

VERBENA ALATA Sweet

Additional and emended bibliography: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208--2210. 1951; Rambo, Sellowia 7: 260 & 288. 1956.

Additional citations: BRAZIL: Minas Gerais: Henschen I.326 [Caldas, 1855] (W--209643); Regnell I.326 [Caldas, 8/2/1865] (W--1323099).

VERBENA AMBROSIFOLIA Rydb.

Additional synonymy: Verbena ambrosifolius Rydb., in herb.

Additional bibliography: Moldenke, Résumé Suppl. 5: 4. 1962.

Specimens of this species have also been misidentified and distributed in herbaria as V. ciliata var. pubera (Greene) Perry, V. hastata L., and V. pinnatifida Lam. The Wooton 642 cited below was identified originally as "V. bipinnatifida x wrightii". The A. H. Howell 159.1 cited below is a mixture with V. bracteata Lag. & Rodr. The Mearns 2677, also cited below, is annotated by Perry as "atypical", while Kearney says of it "why not V. gooddingii?" Moore & Steyermark 3622 is annotated by Perry as V. bipinnatifida var. latilobata Perry. In the United States National Herbarium she has annotated O. B. Metcalfe 1231 and Wooton s.n. [Ojo Caliente, July 18, 1904] as V. ambrosifolia, but I see no glands on them, so I am regarding them as f. eglandulosa Perry. The Clawson 13923 and O. B. Metcalfe 1090 annotated by her as V. wrightii A. Gray and so cited by her (1933) are V. ambrosifolia, at least insofar as the United States National Herbarium specimens are concerned, as is also O. B. Metcalfe 126. The Wooton 364 cited by her and by me as V. wrightii may be a mixture, because the United States National Herbarium and Britton Herbarium specimens are definitely V. ambrosifolia.

The Demaree 12451 & 12451a, Geyer 107, A. Nelson 8245, and Rose & Painter 6427, distributed as V. ambrosifolia in the United States National Herbarium, are all V. bipinnatifida Nutt.; G. L. Fisher 319, Shreve 8797, and Wynd & Mueller 450 are V. ciliata Benth.; E. W. Nelson 4424 & s.n. [May 1898] are V. delticola Small; F. M. Chamberlain 56 is V. gooddingii Briq.; and J. G. Ortega 4541 is V. gooddingii var. nepetifolia Tidestr., while the Eggleston 10737, annotated by Perry as V. ambrosifolia, is actually V. bipinnatifida var. latilobata Perry.

The Kellogg specimen cited below was originally distributed as

V. tenera Spreng. The C. Thomas s.n. [Colorado Terr., 1869] collection is a mixture with V. bracteata Lag. & Rodr. The sheet of E. W. Nelson 6189 in the United States National Herbarium bears this number on a tag attached to the plant and also on the label, but someone has changed it on the label to read "6789".

V. ambrosifolia has been collected on sandy loam bottoms and in fertile alluvial soil of the coastal plain in Mexico.

Additional citations: COLORADO: Denver Co.: J. M. Coulter s.n. [Denver, May 17, 1873] (W--255748); Eastwood 140 (W--582388). Fremont Co.: J. H. Cowen s.n. [Florence, June 14, 1892] (W--216752); Tweedy 102 (W--257534). Huerfano Co.: Shear 4760 (W--858387). Las Animas Co.: C. M. Rogers 4556 (W--2053271), 6126 (W--2053611). Otero Co.: Rose & Fitch 17504 (W--760580). County undetermined: J. H. Cowen 403 [Foothills] (W--254917); C. Thomas s.n. [Colorado Terr., 1869] (W--71930). TEXAS: Bexar Co.: Havard s.n. [San Antonio] (W--155939). Brewster Co.: A. R. Moldenke 171 (Fg); Sperry T.126 (W--1679249). Culberson Co.: Moore & Steyermark 3622 (W--1566713). Dallam Co.: A. H. Howell 140 (W--500265). Hudspeth Co.: A. R. Moldenke 162 (Fg), 163 (Fg), 164 (Fg, Z). Jeff Davis Co.: A. R. Moldenke 165 (Fg, Z, Z). Presidio Co.: A. R. Moldenke 167 (Fg, Z). Ward Co.: Clawson 13923 (W--1085078). NEW MEXICO: Bernalillo Co.: Harward 9 (W--370690), 14 (W--370695); Rose & Fitch 17801 (W--760880). Chaves Co.: Earle & Earle 322 (W--382474); Griffiths 4244 (W--496289). Colfax Co.: Griffiths 5515 (W--496705). Dona Ana Co.: A. R. Moldenke 132 (Fg); Wooton 642 (W--330781). Eddy Co.: P. C. Standley 40334 (W--1221731); Wooton s.n. [Queen, Aug. 2, 1909] (W--736222). Grant Co.: O. B. Metcalfe 126 (W--495243). Lincoln Co.: A. R. Moldenke 130 (Fg, Z); Wooton 363 (W--330588), 364 (N, W--330589); Wooton & Standley 3635 (W--562150), 3691 (W--561431). Otero Co.: Wooton s.n. [Hess Ranch, Aug. 4, 1909] (W--564652). Quay Co.: G. L. Fisher 89 (W--660028); A. R. Moldenke 123 (Fg). Rio Arriba Co.: Eggleston 5957 (W--857727), 6491 (W--660685), 6644 (W--660857). San Miguel Co.: V. Bailey 529 (W--443640), 536 (W--443647); P. C. Standley 4951 (W--498973). Santa Fe Co.: Wooton 2832 (W--736882), 2833 (W--736881), s.n. [Glorieta, Aug. 24, 1910] (W--736885). Sierra Co.: O. B. Metcalfe 1090 (W--498278). Socorro Co.: C. L. Herrick 513 (W--737261); G. R. Vasey s.n. [Socorro, May 1881] (W--155940), s.n. [Socorro, 1881] (W). Tarrant Co.: G. L. Fisher 18 (W--562733); A. R. Moldenke 128 (Fg). Union Co.: A. H. Howell 159.1, in part (W--495047); P. C. Standley 6087 (W--685123). County undetermined: Fendler 586 (W). ARIZONA: Apache Co.: Peebles & Smith 13972 (W--1732898). Coconino Co.: Edw. Palmer s.n. [Little Colorado, 1869] (W--56179). Navajo Co.: L. F. Ward s.n. [Two miles south of Hol-

brook, June 17, 1901] (W-410320), s.n. [Woodruff, June 20, 1901] (W-410319); Zuck s.n. [Holbrook, Aug. 10, 1896] (W-664466), s.n. [Holbrook, Aug. 16, 1896] (W-664465), s.n. [Taylor, Aug. 1, 1897] (W-349023), s.n. [Holbrook, Oct. 9, 1897] (W-664464). Pima Co.: Mearns 2677 (W-234446). MEXICO: Chihuahua: H. S. Gentry 7998 (W-1978779). Coahuila: E. W. Nelson 6189 (W-347415); Pringle 13157 (W-461754); Wynd & Mueller 572 (W-1639970). Nuevo León: Heard, Webster, & Barkley 14512 (W-2134281); Edw. Palmer 1050 (W-1323139). San Luis Potosí: C. L. Lundell 5590 (W-1638806). Sonora: H. S. Gentry 7971 (W-1978765). CULTIVATED: Missouri: J. H. Kellogg s.n. [Mo. Bot. Gard., Aug. 25, 1911] (W-1325356).

VERBENA AMBROSIFOLIA f. *EGLANDULOSA* Perry

Additional bibliography: Moldenke, *Résumé Suppl.* 5: 4. 1962. Humphrey found this plant in yellow pine forests.

Additional citations: TEXAS: Deaf Smith Co.: A. R. Moldenke 120 (Fg). El Paso Co.: F. Wagner 974 (W-228855). NEW MEXICO: Dona Ana Co.: A. R. Moldenke 133 (Fg); P. C. Standley s.n. [mesa just west of Organ Mts., June 13, 1906] (W-560976); Wooton s.n. [Organ, July 14, 1897] (W-736884). Grant Co.: Holzinger s.n. [Santa Rita, Aug. 1, 1911] (W-660557); Mearns 2278 (W-233966). Hidalgo Co.: Mearns 2486 (W-234697); A. R. Moldenke 143 (Fg), 144 (Am, Fg). Sierra Co.: O. B. Metcalfe 1231 (W-498301); A. R. Moldenke 159 (Z). Socorro Co.: A. R. Moldenke 158 (Fg, Z, Z); Wooton 2835 (W-736933). ARIZONA: Cochise Co.: J. I. Carlson s.n. [Douglas, May 13, 1915] (W-873379, W-882856); Cazier s.n. [6 mi. E. Portal, Aug. 27, 1955] (Am); Herb. Arizona State Coll. s.n. [near Southwestern Research Station, 4 May '57] (Am); Herb. Chiricahua Veg.-Study Team 1958-118 (Am), 1959-30 (Am); A. R. Moldenke 134 (Fg, Z, Z), 136 (Am, Fg), 139 (Am), 140 (Am). Greenlee Co.: R. R. Humphrey s.n. [9/2/34] (W-1697813). Pima Co.: Toumey s.n. [Santa Catalina Mts., Sept. 15, 1896] (W-619184), s.n. [Santa Catalina Mts., Sept. 20, 1896] (W-441757). Yavapai Co.: Fulton 9672 (W-1624378). County undetermined: Edw. Palmer s.n. [Arizona, 1869] (W-56218). MEXICO: Sonora: Mearns 1138 (W-229408).

Material of this form has also been misidentified and distributed in herbaria as *V. bracteata* Lag. & Rodr., *V. ciliata* var. *pubera* (Greene) Perry, and *V. gooddingii* Briq. The O. B. Metcalfe 1231 and Wooton s.n. [Ojo Caliente, July 18, 1904] were regarded by Perry and annotated by her as *V. ambrosifolia* Rydb., but I see no glands and so I regard them as f. *eglandulosa*. Of Toumey s.n. [Santa Catalina Mts., Sept. 20, 1896], Edw. Palmer s.n. [Arizona, 1869], and one sheet of J. I. Carlson s.n. [Doug-

las, May 13, 1915] in the United States National Herbarium Kearney says "Why not V. bipinnatifida? Bracts equalling or nearly equalling the calyx", while of Toumey s.n. [Santa Catalina Mts., Sept. 15, 1896] he says "V. bipinnatifida. Bracts nearly equalling calyx. Appr[ooches] V. ciliata in other characters." Of another sheet of J. I. Carlson s.n. [Douglas, May 13, 1915] he says "V. ciliata? glandular pubescence!", but I fail to see the glands; of R. R. Humphrey s.n. [9/2/34] he says "V. bipinnatifida?" I regard all these specimens as f. eglandulosa.

The F. Wagner 974 cited above from El Paso County, Texas, may not actually have come from that county, as its label is inscribed "El Paso to Monument 53".

VERBENA AMOENA Paxt.

Additional citations: MEXICO: México: Pringle 13434 (W--462365).

VERBENA ANDALGALENSIS Moldenke

Additional bibliography: Moldenke, Alph. List Cit. 2: 599. 1948.

The Jørgensen 1613 collection is incorrectly cited by me in my 1938 publication as V. dissecta Willd.

Additional citations: ARGENTINA: Catamarca: Jørgensen 1613 (W--922058--isotype).

VERBENA ANDRIEUXII Schau.

This species has been collected at altitudes of 5200 to 6800 feet, flowering and fruiting in October.

Additional citations: MEXICO: Oaxaca: E. W. Nelson 1513 (W--566002).

VERBENA ARISTIGERA S. Moore

Herbarium material of this species has been misidentified and distributed as V. erinoides L. and as V. multifida Ruiz & Pav.

Additional citations: ARGENTINA: Chaco: Venturi 9780 (W--1591421). Entre Ríos: Lorentz 1053 (W--1233656). CULTIVATED: Germany: Herb. Mus. Bot. Berol. s.n. [1840] (W--546086).

VERBENA ATACAMENSIS Reiche

Additional citations: CHILE: Antofagasta: Werdermann 789 (W--1474301).

VERBENA AURANTIACA Speg.

Additional citations: ARGENTINA: Neuquen: Senn 4326 (W--203433).

xVERBENA BAILEYANA Moldenke

Additional bibliography: H. E. Richter, Cod. Bot. Linn. 35. 1835; H. F. Roberts, Plant Hybrid. before Mendel 28. 1929; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951; Moldenke, Résumé Suppl. 4: 19 & 20. 1962.

In the Richter reference given above it is stated "In Diss. de

Pl. hybrid. (Am. acad. tom. 3. p. 43) commemor. planta inter hanc et *V. spuriam* enata, solis fol. multifido-laciniatis ab hastata diversa, nom.: '*V. tetrandra*, spicis longis acum., fol. multif.-lac.' mox perit, hinc ignota."

VERBENA BAJACALIFORNICA Moldenke

Additional citations: MEXICO: Baja California: Shreve 7169 (W-1749073—isotype).

VERBENA BALANSAE Briq.

Additional bibliography: Fedde in Just, Bot. Jahresber. 33 (1): 632. 1906.

Additional citations: PARAGUAY: Jørgensen 4582 (W-1541008).

ARGENTINA: Corrientes: Pedersen 2906 (W-2283152).

VERBENA BALLSII Moldenke

Additional citations: ARGENTINA: Jujuy: Balls B.6036 [U. S. Nat. Arb. 163273] (W-2250243—isotype).

xVERBENA BEALEI Moldenke

Emended bibliography: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2210. 1951.

VERBENA BERTERII (Meisn.) Schau.

Additional and emended bibliography: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951; Moldenke, Résumé Suppl. 4: 5 & 15. 1962.

Herbarium material of this species has been misidentified and distributed as *V. dissecta* Willd. and as *V. lipozygioides* Walp.

Additional citations: CHILE: Santiago: G. T. Hastings 190 (W-530087); R. A. Philippi 1298 (W-1323088); Wilkes s.n. [Between Valparaíso and San Diego] (W-71950). Valparaíso: Buchtien s.n. [8.IX.1895] (W-1159365); Claude-Joseph 3548 (W-1283379); Killip & Pisano 39710 (W-1953999). Province undetermined: Claude-Joseph 4013 [Bureo] (W-1284313), 4450 [Vicuña] (W-1283808).

VERBENA BIPINNATIFIDA Nutt.

Additional synonymy: *Verbena bipinnata* Nutt., in herb.

Additional and emended bibliography: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951; Shimmers, Spring Fl. Dallas 325. 1958; Moldenke, Résumé Suppl. 4: 21 (1962) and 5: 3 & 4. 1962; Pearce Seeds & Plants, Our Am. Wild Fls. 10. 1962.

This species has been collected on ballast about eastern ports in the United States. The Pearce horticultural supply company describes the species as an "ever-blooming annual". The corolla is described as "deep-pink" by Kearney & Peebles. The Geyer 107 cited below has been previously identified as *V. bracteosa* Michx., *V. aubletia* L., and *V. ambrosifolia* Rydb.! The E. Hall 431 collection is a mixture with *V. pumila* Rydb. and was identified by the collector as *V. bracteosa-aubletia*.

The Earle & Earle 322, Eastwood 140, Fendler 586, G. L. Fisher 18, Griffiths 4244, Harward 9 & 14, C. L. Herrick 513, P. C. Standley 4951, Tweedy 102, Wooton 363, 2832, 2833, and s.n. [Glorieta, Aug. 24, 1910], and Zuck s.n. [Holbrook, Aug. 10, 1896], distributed as V. bipinnatifida, are all V. ambrosifolia Rydb., as is also Wooton 642, distributed as "Verbena bipinnatifida x wrightii". The Cazier s.n. [6 mi. E. Portal, Aug. 27, 1955], Mearns 2486, O. B. Metcalfe 1231, P. C. Standley s.n. [mesa just west of Organ Mts., June 13, 1906], and Wooton s.n. [Organ, July 14, 1897] are all V. ambrosifolia f. eglandulosa Perry, while Rose & Fitch 17106 is V. bracteata Lag. & Rodr.; Waugh 168 is V. canadensis (L.) Britton; Maysilles 7039 is V. ciliata Benth.; Wooton 3849 is V. ciliata var. pubera (Greene) Perry; H. H. Rusby 337, Tidestrom 772 & 898, Toumey s.n. [Galiuro Mts., July 29, 1894], T. E. Wilcox 26 & s.n. [near Williams, April 11, 1905], and Zuck s.n. [Tucson, May 16, 1896] are all V. gooddingii Briq.; Lindheimer s.n. [Texas] and C. T. Mohr s.n. [N. Orleans] are V. halei Small; Kearney & Peebles 9802 and E. W. Nelson 4856 are V. bipinnatifida var. latilobata Perry; G. L. Fisher 207 & 223, Maysilles 7684, Edw. Palmer 74, and Pringle 1117 are V. ciliata Benth.; J. K. Small s.n. [near Wharton, April 12, 1925] is V. ciliata var. longidentata Perry; and Mearns 109, F. G. Plummer s.n. [Lincoln National Forest, 1903], and Wooton s.n. [Divide above Mescalero Agency, June 23, 1895] & s.n. [White Sands, Aug. 25, 1899] are V. wrightii A. Gray.

Kearney says of Toumey s.n. [Santa Catalina Mts., Sept. 20, 1896] and Edw. Palmer s.n. [Arizona, 1869] in the United States National Herbarium "Why not V. bipinnatifida? Bracts nearly equalling calyx", but I regard both collections as V. ambrosifolia f. eglandulosa Perry. He also says of Toumey s.n. [Santa Catalina Mts., Sept. 15, 1896] in the same herbarium "V. bipinnatifida. Bracts nearly equalling calyx. Appr[oaching] V. ciliata in other characters", and of J. I. Carlson s.n. [Douglas, May 13, 1915] "V. bipinnatifida?", but I regard both collections as V. ambrosifolia f. eglandulosa. The Wynd & Mueller 450 cited by me in Phytologia 8: 251 on re-examination will probably prove to be V. ciliata, as are the Maysilles 7039 & 7057 there cited.

Additional citations: ALABAMA: Dallas Co.: R. M. Harper 15 (W—1365890). MISSISSIPPI: Oktibbeha Co.: Weatherby & Weatherby 6313 (W—1604087). INDIANA: Clark Co.: Umbach s.n. [Clarke, June 29, 1898] (W—339478). SOUTH DAKOTA: Fall River Co.: Rydberg 935 (W—210967). Lyman Co.: Over 3177 (W—582996). Stanley Co.: Geyer 107 (W). Washington Co.: W. H. Over 2103 (W—582936). KANSAS: Barber Co.: B. B. Smyth 306 (W). Douglas Co.: W. H. Horr 4368 (W—

2097550); R. L. McGregor 12211 (W--2230321). Ellis Co.: A. S. Hitchcock 393 (W--353120). Meade Co.: W. H. Horr 3448 (W--2030691). Morton Co.: Carleton 177 (W, W); Rose & Fitch 17105 (W--639249). Osborne Co.: Shear 38 (W--227316). Riley Co.: A. Nelson 8245 (W--485794). Scott Co.: Fearing & Latham s.n. [August 14, 1950] (W--2030815). Smith Co.: W. H. Horr E.108 (W--2031069). Wabaunsee Co.: Bartley 1240 (W--1973587). MISSOURI: Jackson Co.: B. F. Bush 4029 (W--606119). ARKANSAS: Hempstead Co.: E. J. Palmer 8045 (W--1531506). LOUISIANA: Rapides Par.: C. R. Ball 401 (W--382754). Saint Mary Par.: Langlois s.n. [Cotes Blanches, 17.VII. 1893] (W--1465962). NEBRASKA: Boyd Co.: F. E. Clements 2776 (W). Sherman Co.: J. M. Winter 75 (W--1679019). OKLAHOMA: Beckham Co.: Demaree 12451 (W--1684883), 12451a (W--1684884). Bryan Co.: C. S. Sheldon 48 (W). Comanche Co.: Hopkins, Nelson, & Nelson 801 (W--1862752); Waterfall 13097 (W--2260931). Custer Co.: A. R. Moldenke 115 (Fg). Harper Co.: G. W. Stevens 305 (W--589065). Kingfisher Co.: Blankinship s.n. [Huntsville, Apr. 16, 1896] (W--313601). Lamar Co.: Demaree 12003 (W--1683782). Murray Co.: J. F. Brenckle 48065 (W--2003822); Merrill & Hagan 303 (W--1653007); G. W. Stevens 14 (W--588951). Woods Co.: G. W. Stevens 699 (W--589223). TEXAS: Bell Co.: L. F. Ward s.n. [Killeen, October 1, 1891] (W--147559); S. E. Wolff 2776 (W--1624007). Bexar Co.: C. R. Ball 909 (W--501971); Groth 30 (W--717649); G. Jermy 86 (W--315685), s.n. [S. Antonio] (W--392397); Larrabee s.n. [Alamo Heights, May 1, 1900] (W--444851); Mrs. H. D. Slater s.n. [San Antonio, 1918] (W--891772). Blanco Co.: Lundell & Lundell 10274 (W--1888919). Brazoria Co.: B. F. Bush 205 (W--386447), 449 (W--386544). Comal Co.: G. L. Fisher 93 (W--1104890); Lindheimer 1072 (W--502445), 1073 (W--502446). Dallas Co.: Lundell & Lundell 10416 (W--1887677), 10568 (W--1888955), 11315 [Plant. Exsicc. Gray. 1275] (W--1925785); J. Reverchon 739 (W--147561, W), s.n. [Curtiss 1962*] (W--1323050, W); M. B. Stephenson s.n. [vicinity of Dallas, Apr. 2, 1929] (W--1432649). DeWitt Co.: A. H. Howell 308 (W--501457). Fisher Co.: T. M. Shepherd s.n. [Grady, April 14, 1901] (W--413915). Frio Co.: Rose & Painter 6427 (W--451706). Guadalupe Co.: F. S. Earle 430 (W--480901). Hemphill Co.: A. H. Howell 111 (W--500236). Hood Co.: E. J. Palmer 6510 (W--1581014). Kaufman Co.: F. J. Tyler s.n. [vicinity of Terrell, May 4, 1904] (W--500802). Kerr Co.: Munson & Hopkins s.n. [Kerrville, Jul. 1889] (W--219990). Kinney Co.: Mearns 1252 (W--229499), 1274 (W--229520), 1394 (W--230042). Kleberg Co.: G. J. Harrison s.n. [Riviera, 2/24/30] (W--1532340). Liberty Co.: Small & Wherry 11781 (W--1738883). Navarro Co.: Joor 107 (W); E. J. Palmer 7821 (W--1531827). Nueces Co.: Marlatt s.n. [Nuecestown, May 27, 1896] (W--266973). Oldham Co.: C. L. Lundell

11462 (W-1926942). Parker Co.: S. M. Tracy 7999 (W-500368). Tarrant Co.: Killian 6779 (W-1465227); McKelvey 1679 (W-1581392); Ruth 107 (W-501767, W-1488932); L. F. Ward s.n. [Fort Worth, Sept. 9, 1877] (W-147557). Taylor Co.: S. M. Tracy 8000 (W-442452). Tom Green Co.: Cory 50566 (W-1886002); Tweedy s.n. [Knickerbocker Ranch, May 1880] (W-147562). Travis Co.: E. Hall 431, in part (W). Uvalde Co.: J. M. Milligan s.n. [Uvalde, April] (W-504333). Val Verde Co.: G. L. Fisher 85 (W-1366096); Wooton s.n. [Del Rio, Nov. 5, 1913] (W-662058). Van Zandt Co.: J. B. Henderson 5698 (W-1468822). Victoria Co.: F. L. Lewton 60 (W); Maxon 3808 (W-500433); E. J. Palmer 9098 (W-1531874). Wichita Co.: Whitehouse 9589 (Mi), 9609 (Mi). County undetermined: Lindheimer III.289 (W-1871004, W). NEW MEXICO: Chaves Co.: Earle & Earle 526, in part (W-382588). County undetermined: C. Wright 1502 (W-56225). ARIZONA: Apache Co.: Edw. Palmer s.n. [Willow Spring, May 1890] (W-56212). Cochise Co.: Blumer 1345 [108] (W-561617, W-563255); Kearney & Peebles 14234 (W-1768656); H. N. Moldenke 21880 (Am, Fg); Ordway s.n. [Rustler Park, July 30, 1955] (Am). Coconino Co.: Kearney & Peebles 13983 (W-1732901); MacDougal 317 (W-334412); Mrs. C. D. Walcott s.n. [Grand Canyon, Aug. 1938] (W-1730904). Gila Co.: Collom 248 (W-1683284). Graham Co.: Darrow, Phillips, & Pultz 1122 (W-1899069); Kearney & Peebles 14153 (W-1732962); Peebles 12989 (W-1679125). Pima Co.: Peebles, Harrison, & Kearney 4549 (W-1368004). MEXICO: Chihuahua: E. W. Nelson 6117 (W-359829); Townsend & Barber 139 (W-383221). MOUNTED DESCRIPTIONS: Am. Midl. Nat. 24: 752. 1940 (W).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry

Emended bibliography: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951.

The Moore & Steyermark 3622 annotated as this variety in the United States National Herbarium by Perry is actually V. ambrosifolia Rydb. On the other hand, of the Eggleston 10737 identified by her in the same herbarium as V. ambrosifolia Kearney says "I make this [to be] V. bipinnatifida var. latilobata" and I agree with him! C. Wright 1503 in the same herbarium was misidentified as V. ambrosifolia.

Additional citations: ARIZONA: Cochise Co.: Eggleston 10737 (W-664802); Griffiths 4833 (W-496451); Herb. Chiricahua Veg.-Study Team 1959-442 (Am); A. R. Moldenke 138 (Am), 145 (Am); Ordway s.n. [Rustler Park, July 30, 1955] (Am); T. E. Wilcox s.n. [near Fort Huachuca, Sept. 1894] (W-212941). Gila Co.: Peebles & Smith 14093 (W-1732943). Graham Co.: Kearney & Peebles 9802 (W-1624416). Pima Co.: Griffiths & Thornber 159 (W-497223); M. E. Jones s.n. [Santa Rita Mts., Aug. 24, 1903] (W-856989). Santa

Cruz Co.: Kearney & Peebles 10130 (W--1624502). MEXICO: Chihuahua: E. W. Nelson 4856 (W--332903); C. Wright 1503, in part (W--71927). Michoacán: Hinton 13125 (W--1891037). Sonora: Hartman 906 (W--1892542--isotype).

xVERBENA BLANCHARDI Moldenke

Emended synonymy: Verbena blanchardii Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210, sphalm. 1951.

Emended bibliography: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951.

The E. W. Lathrop 369 & 488, distributed as xV. blanchardi, are actually xVerbena moechina Moldenke.

VERBENA BONARIENSIS L.

Additional synonymy: Verbena bonaerensis L., in herb.

Additional and emended bibliography: C. Murr., Brit. Gard. 2: 479. 1799; Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825; Benth. & Muell., Fl. Austral. 5: 36--37. 1870; E. H. L. Krause in Sturm, Fl. Deutschl. 15: 305. 1907; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208--2210. 1951; Rambo, Sellowia 7: 260. 1956; Moldenke, Résumé Suppl. 4: 1--5, 14, 16, & 19 (1962) and 5: 1--3. 1962.

Emended illustrations: Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2210. 1951.

An additional common name is "cluster-flower'd vervain". The species was apparently already in cultivation in England in 1799 according to the Murray reference cited above. It has been collected on dry hillsides in Jamaica.

For those students interested in noting the rapidity of spread of introduced plants, the following dates when this species was first collected in a given county (as far as I am now aware) will be of interest: North Carolina: Bladen, Currituck, and New Hanover Counties - 1950; South Carolina: Charleston County - 1879, Georgetown County - 1939; Georgia: Richmond County - 1899, Chatham County - 1929, Calhoun County - 1947; Alabama: Tuscaloosa County - 1938; Mississippi: Rankin County - 1927; Arkansas: Saint Francis County - 1925, Ashley and Drew Counties - 1938, Bradley County - 1939; Louisiana: Terrebonne Parish - 1931, Tangipahoa Parish - 1938; Texas: Tyler County - 1939, Jefferson County - 1948; California: Yuba County - 1938, Marin County - 1943, Fresno County - 1946; Bermuda - 1921.

The E. Carter 91, E. S. Ford 3785, Godfrey & Shunk 4072, and L. S. Rose 39200, distributed as V. bonariensis, are all V. brasiliensis Vell., as are also Campos Novaes 916, A. Carvalho s.n. [Herb. Inst. Bot. S. Paulo 190], Claude-Joseph 1286, Dusén 14320, Julio 49, Mexia 5275, T. Meyer 4245, Miers s.n. [Mendoza], and Semper 293. The Buchtien 4683 and Cárdenas 327, distributed as V. bonariensis, are V. hispida Ruiz & Pav.; G. L. Fisher 168, A. A. Heller 2046, Hosaka 1354, and Mendes Magalhães 3151 are V. litoralis H.B.K.; and

Barkelew [not "Barkeley" as stated in *Phytologia* 8: 257. 1962]

231 and O. Solis 20 are V. sphaerocarpa Perry.

Bentham (1870) cites the following additional specimens not as yet seen by me: AUSTRALIA: New South Wales: Beckler s.n. [Hastings river]; F. Mueller s.n. [near Sydney]; C. Stuart s.n. [New England]. Queensland: F. Mueller s.n. [Brisbane river, Moreton Bay].

Additional citations: NORTH CAROLINA: Currituck Co.: W. B. Fox s.n. [1/2 mi. n. of Point Harbor] (W--2265467). Wayne Co.: A. R. Moldenke 463 (Fg). SOUTH CAROLINA: Charleston Co.: Curtiss 1963** (W), s.n. [Charleston, 1875] (W); L. R. Gibbs s.n. (W--203816, W--203817); W. Palmer s.n. [Charleston, June 2--10, 1902] (W--513666). Columbus Co.: A. R. Moldenke 452 (Fg). Florence Co.: A. R. Moldenke 453 (Fg). Georgetown Co.: Godfrey & Tryon 268 (W--1837175). Horry Co.: A. R. Moldenke 454 (Fg). Kershaw Co.: A. R. Moldenke 443 (Fg). Lee Co.: A. R. Moldenke 446 (Fg). Lexington Co.: A. R. Moldenke 434 (Fg). GEORGIA: Bibb Co.: A. R. Moldenke 371 (Fg). Bleckley Co.: A. R. Moldenke 379 (Fg). Brooks Co.: A. R. Moldenke 308 (Fg), 312 (Fg). Burke Co.: A. R. Moldenke 406 (Fg). Calhoun Co.: R. F. Thorne 3659 (W--1929865). Grady Co.: A. R. Moldenke 298 (Fg). Jefferson Co.: A. R. Moldenke 405 (Fg). Lanier Co.: A. R. Moldenke 327 (Fg). Monroe Co.: A. R. Moldenke 387 (Fg). Screven Co.: A. R. Moldenke 416 (Fg). FLORIDA: Bradford Co.: Murrill 534 (W--1928354). Liberty Co.: A. R. Moldenke 278 (Fg). Marion Co.: Gist 105 (W--1653820). ALABAMA: Tuscaloosa Co.: R. M. Harper 3672 (W--1731623). MISSISSIPPI: Madison Co.: McDougall 1383 (W--1924874). LOUISIANA: Ouachita Par.: J. A. Drushel 9478 (W--1654135). Saint Tammany Par.: Arsène 11859 (W--1031873), 12534 (W--1222964). TEXAS: Angelina Co.: Tharp 2558 (W--1221348). Harris Co.: A. R. Moldenke 216 (Fg). Jefferson Co.: J. F. Brenckle 48071 (W--2003825); A. R. Moldenke 222 (Fg). CALIFORNIA: Marin Co.: J. T. Howell 19323 (W--1872594). Yuba Co.: A. A. Heller 15162 (W--1974207). BERMUDA ISLANDS: Main: Brown & Britton 98 (W--1341080); F. S. Collins 266 (W--717560). JAMAICA: J. H. Hart s.n. (W--1323053); Killip 307 (W--1045096); Maxon 2615 (W--520584); Maxon & Killip 569 (W--1046299); C. R. Orcutt 2736 (W--1411664). BRAZIL: Minas Gerais: F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 2912] (N); Kuntze s.n. [Contendos, Dec. '92] (N); Regnell II.210 [Caldas] (N), II.210 [1843] (W--209641). Rio de Janeiro: Holway & Holway 1180 (W--1188224), 1454 (W--1199294); Lund s.n. [Rio] (N). Rio Grande do Sul: Rambo 51444 (W--2102030). São Paulo: F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 1361] (N); Usteri s.n. [Herb. Esc. Polytec. 254b; Herb. Inst. Bot. S. Paulo 15724] (N). BOLIVIA: Santa Cruz: Cárdenas 5130 (W--2250684). PARAGUAY: Jørgensen 3768 (W--1483628). URUGUAY: Herter

268 [Herb. Herter 81709] (N, W--1341848); Lorentz 934 (W--1233689). CHILE: Curicó: Herb. Mus. Nac. Santiago 4 (N). Llanquihue: Gunckel 16865 (W--1997763). Valdivia: Buchtien s.n. [Valdivia, 1898] (W--1159368); H. Krause s.n. [Coral] (W--1690233). ARGENTINA: Buenos Aires: Brizuela 1459 (W--2198122). Chaco: Venturi 84 (W--1043709). Corrientes: Pedersen 1333 (W--2283062). Misiones: Pedersen 4341 (W--2283778). Tucumán: Venturi 123 (W--1591212), 525 (W--1591223), 2936 (W--1591273). AZORES ISLANDS: Faial: C. S. Brown 215 (W--262278). REPUBLIC OF SOUTH AFRICA: Natal: Sidey 2058 (S). Transvaal: Schlieben 7176 (W--2272136). INDIA: Uttar Pradesh: R. R. Stewart 16007 (W--1992151). State undetermined: C. B. Clarke 24476G [Dhurmsala] (W--802905). MELANESIA: New Caledonian Islands: Ile des Pins: M. R. Germain s.n. [U. S. Nat. Arb. 218555] (W--2185103). New Caledonia: Franc A. 1693 [U. S. Nat. Arb. 218556] (W--2185088). POLYNESIA: Austral Islands: Saint Mary's: Eights s.n. (W--920098).

VERBENA BONARIENSIS f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Résumé Suppl. 4: 5 & 6. 1962.

VERBENA BONARIENSIS var. CONGLOMERATA Briq.

Additional bibliography: Moldenke, Résumé Suppl. 4: 2. 1962.

Additional citations: PARAGUAY: Jørgensen 3774 (W--1484054).

VERBENA BRACTEATA Lag. & Rodr.

Additional synonymy: Verbena bracteosa brevibracteata Gray, in herb.

Additional and emended bibliography: Spreng. in L., Syst. Veg., ed. 16, 2: 749. 1825; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951; Shimmers, Spring Fl. Dallas 325. 1958; Moldenke, Résumé Suppl. 4: 1, 3, & 4 (1962) and 5: 1--5 & 7. 1962; Lehr, Bull. Torr. Bot. Club 89: 56. 1962.

Herbarium material of this species has also been misidentified and distributed as V. remota Benth. The Herb. Arizona State Coll. s.n. [near Southwestern Research Station, 4 May '57], distributed as V. bracteata, is actually V. ambrosifolia f. eglandulosa Perry, while Pataky s.n. [Fort Huachuca, 1890] is V. gracilis Desf.; Rugel s.n. [ad vias et in incultis arenosis, per Alabamam mediam, Sept. 1843] is V. canadensis (L.) Britton; E. W. Hammond 322 is V. lasiostachys var. septentrionalis Moldenke; and J. Let s.n. [San Diego, Nov. 9] is V. menthaefolia Benth.

The A. H. Howell 159.1 & 159.2 and C. Thomas s.n. [Colorado Terr., 1869] collections are mixtures with V. ambrosifolia Rydb. The H. R. Bennett s.n. [Brewster Arnold Ranch, August 2, 1957] specimen cited below bears a notation, probably by the collector, "evidently a hybrid with V. stricta Vent. or some other species", but I do not agree -- to me it seems to be typical V. bracteata.

A common name for the species in Mexico is "chichiro". Lehr (1962) records V. bracteata from Rockland County, New York.

Additional citations: ALBERTA: Macleod Co.: E. H. Moss 204 (W-1896368). BRITISH COLUMBIA: Cariboo Co.: J. Macoun s.n. [Kamloops, June 13th 1889] (W--219610). Yale Co.: Calder & Savile 9668 (W-2310062). NEW JERSEY: Hudson Co.: Van Sickle s.n. [Weehawken, July 20, '94] (W--309649), s.n. [Weehawken, Aug. 1894] (W--243276). PENNSYLVANIA: Lancaster Co.: A. A. Heller s.n. [August 29, 1900] (W--407053). Philadelphia Co.: Martindale s.n. [Phila., 8/78] (W-147565). VIRGINIA: Southampton Co.: A. A. Heller 1012 (W). NORTH CAROLINA: Iredell Co.: Ruger s.n. [Statesville] (W--310734). County undetermined: Ashe s.n. [Southeastern N. C.] (W--327849). GEORGIA: DeKalb Co.: J. K. Small s.n. [Stone Mtn., July 1-6, 1895] (W--298966). Gwinnett Co.: H. A. Allard 207 (W--513129). Lee Co.: J. D. Smith 151 (W--1323056), 1961 (W--1323057). FLORIDA: Franklin Co.: Biltmore Herb. 1082b (W--332102). ALABAMA: DeKalb Co.: Ruth 501 (W--345682). Jackson Co.: L. F. Ward s.n. [Stevenson, Sept. 5, 1877] (W--147564). Lee Co.: Earle & Baker s.n. [Auburn, 5/13/1898] (W--344792). Mobile Co.: C. T. Mohr s.n. [Mobile, May 22, 1884] (W--771884). Morgan Co.: J. D. Smith 152 (W--1323055). Tuscaloosa Co.: Pollard & Maxon 333 (W--442883). ILLINOIS: Cook Co.: H. H. Babcock s.n. [Chicago] (W--787353). Menard Co.: E. Hall s.n. [Athens, Sept. 1868] (W). St. Clair Co.: Eggert s.n. [E. St. Louis, June 11, 1879] (W--754560). County undetermined: G. R. Vasey s.n. [Illinois] (W--314208). INDIANA: Howard Co.: Ek 16 (W--1849580). Lake Co.: Umbach s.n. [Lake Station, June 6, 1896] (W--339477). Steuben Co.: C. C. Deam 1272 (W--607256). Vigo Co.: Evermann s.n. [Terre Haute, June 17, 1889] (W--645927). County undetermined: H. W. Clark 1745 [Keen's, Lake Maxinkuckee] (W--407572). IOWA: Fayette Co.: Fink 210 (W--214899). Henry Co.: R. A. Davidson 2456 (W--2261079). Johnson Co.: Somes 3596 (W--672324). Story Co.: C. R. Ball 86 (W--280243); H. S. Fawcett 12 (W--493389). KENTUCKY: Jefferson Co.: C. W. Short s.n. [borders of the Ohio below Louisville] (W--771885). WISCONSIN: Trempealeau Co.: Hartley & Hartley 372 (W--2261772); F. J. Hermann 8954 (W--1732399). County undetermined: "J. H. S." s.n. [July 22, 1887] (W--752025). MINNESOTA: Mille Lacs Co.: E. P. Sheldon s.n. [Princeton, July 1892] (W). Ramsey Co.: Mearns 524 (W--649504). NORTH DAKOTA: Benson Co.: Lunell s.n. [Leeds, October 7, 1915] (W--893170). Cass Co.: O. A. Stevens s.n. [Fargo, Aug. 17, 1949] (W--1973377). Morton Co.: Sarvis 122 (W--584955). SOUTH DAKOTA: Custer Co.: Over 1779 (W--582808). Jackson Co.: J. F. Brenckle 39-74 (W--1826779). Lawrence Co.: W. P. Carr 179 (W--751175); Rydberg 934 (W--210966). Meade Co.: Forwood 298 (W--317830). Washington Co.: Over 2389 (W--582964). KANSAS: Douglas Co.: W. H. Horr E.570 (W--2031273); W. C.

Stevens s.n. [Lawrence] (W--216102). Finney Co.: Coville 24 (W--361474); Meuble s.n. [Garden City, June 7, 1891] (W--244965). Grant Co.: C. H. Thompson 42 (W--270168). Jewell Co.: W. H. Horr 4394 (W--2097565). Kearney Co.: A. S. Hitchcock 1129 (W--353932). Marion Co.: W. H. Horr 3472 (W--2030700). Morton Co.: Rose & Fitch 17106 (W--639250). Osborne Co.: Shear 62 (W--227339), 101 (W--227314). Riley Co.: J. B. S. Norton 392 (W--353119). Woodson Co.: E. W. Lathrop 1276 (W--2235252). Wyandotte Co.: G. Smith s.n. [Kansas City, July 26, 1871] (W--2311016). MISSOURI: Greene Co.: P. C. Standley 9362 (W--688277). Saint Louis: Eggert s.n. [waste places, St. Louis, 2 July 1875] (W--1323059); Engelmann s.n. [St. Louis, Sept. 1841] (W). Wayne Co.: E. J. Palmer 6106 (W--1581048). ARKANSAS: Craighead Co.: Demaree 7027 (W--1438449). Pulaski Co.: Demaree 8623 (W--1582392). Saline Co.: F. C. Haas 181 (W--1654359). Sebastian Co.: Bigelow s.n. [Fort Smith] (W). LOUISIANA: Rapides Par.: C. R. Ball 553 (W--382825). MONTANA: Dawson Co.: L. F. Ward s.n. [Glendive, July 17, 1883] (W--147563). Gallatin Co.: Blankinship I. 410 (W--540464). Glacier Co.: P. C. Standley 18764 (W--1026465). Jefferson Co.: R. Adams s.n. [between Madison & Jefferson rivers, Sept. 7, '71] (W--235943). Powell Co.: E. L. Morris s.n. [Gold Creek, August 1894] (W--2328727). Rosebud Co.: H. R. Bennett s.n. [10 mi. east of Lane Deer, 7-25-57] (W--2300907), s.n. [Brewster Arnold Ranch, August 2, 1957] (W--2300906). Sanders Co.: Sandberg, MacDougal, & Heller 972 (W--238477). Sweet Grass Co.: Eggleston 7970 (W--544156). IDAHO: Ada Co.: J. A. Clark 55 (W--543356), 279 (W--543455). Bingham Co.: J. M. Coulter s.n. [Blackfoot, 1872] (W--235942); Edw. Palmer 255 (W--288316). Bonner Co.: Epling 10380 (W--1604456). Canyon Co.: Macbride 200 (W--542184). Custer Co.: L. F. Henderson 4070 (W--240327). Fremont Co.: E. D. Merrill 429 (W--390839); Merrill & Wilcox 776 (W--580875). Idaho Co.: Q. Jones 366 (W--2054330). Nez Perce Co.: L. F. Henderson s.n. [near Lewiston, June 18, '94] (W--226468); Sandberg, MacDougal, & Heller 264 (W--242923). WYOMING: Albany Co.: A. Nelson 7671 (W--433812). Natrona Co.: Goodding 207 (W--485108). Niobrara Co.: F. H. Knowlton 148 (W--272918). Yellowstone National Park: Mearns 302 E.C.S. (W--488863), 2698 (W--487268), 5009 (W--488519). County undetermined: A. Nelson 320 (W--284505). UTAH: Emery Co.: M. E. Jones 5478 (W--249911). Grand Co.: Rydberg & Garrett 8365 (W--765012). Kane Co.: Tidestrom 2390 (W--508099). Piute Co.: Rydberg & Carlton 7043 (W--506429). Salt Lake Co.: S. Watson 823 (W). San Juan Co.: Rydberg & Garrett 9201 (W--765186). Sanpete Co.: Tidestrom 161 (W--506968); L. F. Ward 256 (W--147566, W--221200). Utah Co.: Tidestrom 1735 (W--507242). NEVADA: Clark Co.: Alexander & Kellogg 1739 (W--1826991); Clokey

8096 (W--1785517). Lander Co.: A. E. Hitchcock 583 (W--765930). Storey Co.: Purpus 5946 (W--348137). County undetermined: S. G. Stokes s.n. [Grand Junction, June 15, 1900] (W--404499). COLORADO: Archuleta Co.: C. F. Baker 564 (W--368089). Boulder Co.: Ewan s.n. [Pl. Exsic. Gray. 1090] (W--1828391). Conejos Co.: P. C. Standley 6496 (W--685518). Denver Co.: Eastwood 25 (W--582271); H. G. Smith Jr. s.n. [Plains near Denver, Sep. 9, 1888] (W). Eagle Co.: Killip 36454 (W--1829030). El Paso Co.: Biltmore Herb. 1082c [1-344] (W--980795); Clements & Clements 9 (W--580010); Curtiss s.n. [Colorado Springs] (W--202204). Gunnison Co.: C. F. Baker 920 (W--412533). La Plata Co.: Tweedy 433 (W--370445); Wooton 2836 (W--562272, W--737206). Larimer Co.: J. H. Cowen 404 (W--254916), 2019 (W--489493). Montrose Co.: C. F. Baker 288 (W--411953); E. P. Walker 402 (W--543789). Otero Co.: Crandall s.n. [Rocky Ford, June 13, 1891] (W--216753); Rose & Fitch 17503 (W--760579). Washington Co.: H. L. Shantz 1084 (W--583884), 1200 (W--584004), 1229 (W--584011). County undetermined: C. Thomas s.n. [Colorado Terr., 1869] (W--71930). NEBRASKA: Buffalo Co.: J. H. Holmes 12 (W), 20 (W). Cass Co.: T. A. Williams s.n. [Weeping Water, June 1885] (W--750381). Cedar Co.: F. E. Clements 2612 (W). Lancaster Co.: Seal s.n. [Lincoln, 6-10-94] (W--2311054); H. J. Webber s.n. [Lincoln, June 20, 1888] (W--216319); T. A. Williams s.n. [Lincoln, June 5, 1889] (W--750382). Thomas Co.: Rydberg 1306 (W--210371). OKLAHOMA: Beckham Co.: A. R. Moldenke 116 (Fg). Caddo Co.: Demaree 12533 (W--1683845). Cimarron Co.: C. M. Rogers 4668 (W--2053022). TEXAS: Deaf Smith Co.: A. R. Moldenke 121 (Fg). Donely Co.: A. R. Moldenke 119 (Fg). El Paso Co.: B. Barlow s.n. [Camitillo, 7 July 1911] (W--1521741); Dieffenderffer 90 (W--2311831); G. R. Vasey s.n. [El Paso, May 1881] (W--155632); C. Wright 454 (W). Grady Co.: A. R. Moldenke 118 (Fg). Hale Co.: Whitehouse 9926 (Mi). Howard Co.: Havard s.n. [w. of Big Spring, Sept. 1881] (W--155631, W--221203). Lamb Co.: Tharp 6274 (W--1465159). Lipscomb Co.: A. H. Howell 63 (W--500188). Lubbock Co.: Demaree 7704 (W--1469002); E. L. Reed 3058 (W--1520199), 3291 (W--1520198); Tharp 6284 (W--1465165); Wooton s.n. [Lubbock, May 3, 1925] (W--1244608). Moore Co.: Jespersen & Jespersen 2708 (W--2003035). Potter Co.: C. R. Ball 1675 (W--503065). Randall Co.: J. F. Baker 42 (W--500414). Tarrant Co.: Killian 6784 (W--1465230); Ruth 109 (W--501769); Whitehouse 16263 (Mi). Taylor Co.: S. M. Tracy 8001 (W--442453). Val Verde Co.: Parry, Bigelow, Wright, & Schott 829 (W--56193). Wheeler Co.: A. R. Moldenke 117 (Fg). County undetermined: Havard s.n. [Texas, Spt. 1881] (W--221199). NEW MEXICO: Bernalillo Co.: C. C. Ellis 221 (W--662639). Catron Co.: A. R. Moldenke 157 (Fg, Z). Chaves Co.: Earle & Earle 351 (W--

382500). Colfax County: Cockerell s.n. [Raton, Aug. 29, 1900] (W-562274); Griffiths 5560 (W-496719); P. C. Standley 6268 (W-685299), 14249 (W-897032). Dona Ana Co.: P. C. Standley 474 (W-564402), s.n. [Mesilla Valley, June 15, 1906] (W-560977); Wooton s.n. [Mesilla Valley, May 17, 1893] (W-241169), s.n. [San Augustine Ranch, Aug. 28, 1897] (W-736942); Wooton & Standley s.n. [Mesilla Valley, July 28, 1907] (W-561429). Eddy Co.: Wooton s.n. [vicinity of Queen, Aug. 2, 1909] (W-564655, W-736936). Grant Co.: O. B. Metcalfe 137 (W-495254). Guadalupe Co.: A. R. Moldenke 125 (Fg). Lincoln Co.: A. R. Moldenke 131 (Fg). Quay Co.: G. L. Fisher 152 (W-660110); A. R. Moldenke 122 (Fg). Rio Arriba Co.: Cockerell s.n. [No Agua, Aug. 1912] (W-691096); P. C. Standley 6602 (W-685624); Standley & Bollman 10852 (W-689538); Wooton s.n. [Aug. 16, 1904] (W-736937). San Juan Co.: P. C. Standley 6927 (W-685936), 7252 (W-686223), 7896 (W-686843); Wooton 2831 (W-736935), 2834 (W-736940), s.n. [Farmington, Aug. 8, 1904] (W-562254). San Miguel Co.: P. C. Standley 4549 (W-498776), 5136 (W-499113); Studhalter S.3028 (W-1735151). Santa Fe Co.: P. C. Standley 4458 (W-498751); Wooton s.n. [near Tesuque, Aug. 20, 1904] (W-736941). Sierra Co.: O. B. Metcalfe 1008 (W-497890). Socorro Co.: H. H. Rusby 6512a (W-147567). Torrance Co.: A. R. Moldenke 129 (Fg). Union Co.: A. H. Howell 159.2 (W-495047). County undetermined: Fendler 587 (W); Wooton s.n. [Inscription Rock, Aug. 1, 1892] (W-736939), s.n. [Gallo Spring, July 13, 1906] (W-736938). ARIZONA: Coconino Co.: Clute 93 (W-1070295); Collom 723 (W-1729448); Fernow s.n. [Little Colorado River, August '96] (W-479895); MacDougal 286 (W-334382); A. R. Moldenke 149 (Fg); G. A. Pearson 4 (W-563054), 355 (W-563246). Navajo Co.: Mrs. Hough s.n. [Holbrook, June 1905] (W-890166); Peebles 9636 (W-1624366); L. F. Ward s.n. [Holbrook, June 15, 1901] (W-410318); Wooton s.n. [7/19/1892] (W-241170). Yavapai Co.: Peebles, Harrison, & Kearney 4243 (W-1367578). WASHINGTON: Douglas Co.: Sandberg & Leiberg 340 (W-288317). Franklin Co.: Leekenby s.n. [Pasco, Aug. 8, 1898] (W-622148). Kittitas Co.: Cotton 1363 (W-525459); J. W. Thompson 9067 (W-1419794). Klickitat Co.: Suksdorf s.n. [July 22, 1881] (W-147585). Stevens Co.: Kreager 474 (W-441290). Walla Walla Co.: R. M. Horner 18 (W-281424); Wilkes s.n. [Walla Walla, Oregon] (W). Whitman Co.: Elmer 324 (W-277025). Yakima Co.: Cotton 621 (W-525153). County undetermined: E. P. Sheldon 8202 (W-329122); G. R. Vasey 468 (W-296747). OREGON: Morrow Co.: J. W. Thompson 4880 (W-1436931). Sherman Co.: W. E. Lawrence 413 (W-983724). Umatilla Co.: H. E. Brown 58 (W-283048); Griffiths & Hunter 18 (W-527103); Leiberg 902 (W-288318). Union Co.: E. P. Sheldon 8856 (W-528497). Wasco Co.:

Isat s.n. [Williamson's Exped.] (W). County undetermined: Cusick 1967 [eastern Oregon] (W--354693). CALIFORNIA: Inyo Co.: Coville & Funston 953 (W--56220). Kings Co.: Kearney 2 (W--410798). Los Angeles Co.: Braunton 379 (W--465367). Monterey Co.: G. R. Vasey 512 (W--56219). San Bernardino Co.: Parish & Parish 2171 (W--56201, W--56222). Tulare Co.: Edw. Palmer 2699 (W--277861). County undetermined: Griffiths & Morris 49 [Humboldt River bottoms near Minnemucca] (W--402546); L. Schoenfeldt 2925 (W--240859). MEXICO: Baja California: C. R. Orcutt 223 (W--1323062). Chihuahua: E. Stearns 7 (W--502757). Coahuila: Edw. Palmer 1048 (W--56174). Sonora: P. B. Kennedy 7032 (W--1287203). CULTIVATED: Switzerland: Herb. Hort. Basil. s.n. [Aug. 1839] (W--264622). LOCALITY OF COLLECTION UNDETERMINED: Havard s.n. [Penitence] (W--218868); P. C. Standley s.n. [along the Rio Grande river, May 4, 1906] (W--564309). MOUNTED CLIPPINGS: Lag. & Rodr., Anal. Cienc. Nat. 4: 260. 1801 (W); Woot. & Standl., Contrib. U. S. Nat. Herb. 16: 166. 1913 (W).

VERBENA BRASILIENSIS Vell.

Additional and emended bibliography: Fedde in Just, Bot. Jahresber. 33 (1): 632. 1906; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951; Moldenke, Résumé Suppl. 4: 1-3 (1962) and 5: 1-5. 1962.

The Hammarlund 631 in the Stockholm herbarium, cited in Phytologia 8: 321 (1962) as this species, is actually V. parvula var. gigas Moldenke, while the Jørgensen 3767 [Herb. Osten 22248] in the Montevideo herbarium, cited on page 322 of the same work, seems, on re-examination, actually to represent V. litoralis H.B.K. The A. S. Kaltenborn 160 [Kaltenborn & Kaltenborn 160] cited by me in my Alph. List Cit. 2: 602 (1948) and in Phytologia 8: 321 (1962) is V. parvula Hayek.

Herbarium material of V. brasiliensis has been misidentified and distributed as V. bonariensis α brevibracteata Kuntze, "Verbena litoralis H.B.K.", and "Stachytarpheta jamaicense (L.) Vahl". A common name for the plant in Peru is said to be "pepermo!"

For students interested in the speed of spread of this species in the southern United States, the following dates are given when the species was first collected (as far as I am aware) in the various states and counties: Virginia: Warwick County - 1937; North Carolina: New Hanover County - 1897, Pender County - 1932, Northampton County - 1948, Brunswick County - 1949; South Carolina: Barnwell, Columbus, and Kershaw Counties - 1962; Georgia: Glynn County - 1923, Chatham County - 1927, Bacon, Bibb, Bleckley, Clinch, Dodge, Jeff Davis, Jefferson, Lowndes, Putnam, Screven, Telfair, Thomas, Twiggs, and Ware Counties - 1962; Florida: Escambia County - 1899, Washington County - 1930, Leon County - 1955, Taylor County - 1957; Alabama: Mobile County - 1893, Sumter County - 1960, Baldwin County - 1962; Mississippi: Forrest County - 1932,

Jones County - 1940, Jefferson County - 1946, Harrison County - 1949, Hancock County - 1950, Lee and Pike Counties - 1955, Jackson and Pearl River Counties - 1962; Louisiana: Plaquemines Parish - 1900, Orleans Parish - 1901, Terrebonne Parish - 1914, East Baton Rouge Parish - 1927, Jefferson Parish - 1937, Saint Tammany Parish - 1939, Tensas Parish - 1940, Calcasieu, Cameron, Iberia, Jefferson Davis, Saint Mary, and Washington Parishes - 1962; Texas: Hardin, Jefferson, and Orange Counties - 1945, Wharton County - 1946, Victoria County - 1962; California: San Joaquin County - 1903, Nevada County - 1941, Stanislaus County - 1958, Butte County - 1959.

Additional citations: VIRGINIA: Warwick Co.: Fernald & Long 7585 (W--1699825). NORTH CAROLINA: Bladen Co.: A. R. Moldenke 461 (Fg). New Hanover Co.: Biltmore Herb. 5707 (W--332104); Godfrey & Shunk 4072 (W--1767208); McCarthy 8 (W). SOUTH CAROLINA: Bamberg Co.: A. R. Moldenke 427 (Fg). Barnwell Co.: A. R. Moldenke 422 (Fg). Columbus Co.: A. R. Moldenke 457 (Fg). Dillon Co.: A. R. Moldenke 450 (Fg). Horry Co.: A. R. Moldenke 455 (Fg). Kershaw Co.: A. R. Moldenke 442 (Fg), 445 (Fg). Lee Co.: A. R. Moldenke 436 (Fg). Lexington Co.: A. R. Moldenke 433 (Fg). Marion Co.: A. R. Moldenke 449 (Fg). Orangeburg Co.: A. R. Moldenke 435 (Fg). Richland Co.: A. R. Moldenke 439 (Fg), 441 (Fg). GEORGIA: Bacon Co.: A. R. Moldenke 346 (Fg). Bibb Co.: A. R. Moldenke 369 (Fg). Bleckley Co.: A. R. Moldenke 376 (Fg). Chatham Co.: Kolthoff s. n. [Savanna, 27 Maj 1927] (W--1367190). Clinch Co.: A. R. Moldenke 329 (Fg). Dodge Co.: A. R. Moldenke 363 (Fg). Glynn Co.: McAtee 3295 (W--1114063); H. N. Moldenke 1184 (W--1581762). Jeff Davis Co.: A. R. Moldenke 354 (Fg). Jefferson Co.: A. R. Moldenke 404 (Fg). Lowndes Co.: A. R. Moldenke 320 (Fg, Z). Putnam Co.: A. R. Moldenke 389 (Fg). Screven Co.: A. R. Moldenke 413 (Fg). Telfair Co.: A. R. Moldenke 362 (Fg). Thomas Co.: A. R. Moldenke 306 (Fg). Twiggs Co.: A. R. Moldenke 390 (Fg). Ware Co.: A. R. Moldenke 336 (Fg). FLORIDA: Escambia Co.: Curtiss 6490 (W--357553); S. M. Tracy 8706 (W--510598). Washington Co.: F. S. Blanton 6598 (W--1485525); E. S. Ford 3785 (W--2230914). ALABAMA: Baldwin Co.: A. R. Moldenke 262 (Fg, Z). Mobile Co.: C. T. Mohr s. n. [July 4, 1893] (W--771881); A. R. Moldenke 261 (Fg). MISSISSIPPI: Harrison Co.: A. R. Moldenke 253 (Fg). Jackson Co.: A. R. Moldenke 258 (Fg). Jefferson Co.: McDougall 1036 (W--1925222). Pearl River Co.: A. R. Moldenke 249 (Fg). LOUISIANA: Assumption Par.: A. R. Moldenke 236 (Fg). Calcasieu Par.: A. R. Moldenke 226 (Fg). Cameron Par.: A. R. Moldenke 233 (Fg). Iberia Par.: A. R. Moldenke 229 (Fg). Jefferson Davis Par.: A. R. Moldenke 235 (Fg). Lafourche Par.: A. R. Moldenke 240 (Fg). Plaquemines Par.: Tracy & Lloyd 20 (W--383532). Saint Charles Par.: A. R. Moldenke 241 (Fg). Saint Mary Par.: A. R. Moldenke 231 (Fg). Saint Tammany Par.: A.

R. Moldenke 243 (Fg). Terrebonne Par.: A. R. Moldenke 238 (Fg). Vermilion Par.: A. R. Moldenke 234 (Fg). Washington Par.: A. R. Moldenke 247 (Fg), 248 (Fg, Z). TEXAS: Hardin Co.: C. L. Lundell 14083 (W--2235974). Harris Co.: A. R. Moldenke 213 (Fg, Z, Z). Jefferson Co.: J. F. Brenckle 48073 (W--2003826); C. L. Lundell 14136 (W--1927003); A. R. Moldenke 221 (Fg), 224 (Fg, Z). Liberty Co.: A. R. Moldenke 217 (Fg), 218 (Fg). Orange Co.: Cory 50840 (W--1886061). Victoria Co.: A. R. Moldenke 202 (Fg, Z). CALIFORNIA: Fresno Co.: E. Carter 91 (W--1926299). Yuba Co.: L. S. Rose 39200 (W). ECUADOR: Azuay: Rose, Pachano, & Rose 22845 (W--1022442), 22846 (W--1022443). PERU: Cuzco: Cook & Gilbert 271 (W--603500), 1208 (W--604407). BRAZIL: Minas Gerais: Mexia 5275 (W--1705014). Paraná: Dusén 14320 (W--1481776). Rio de Janeiro: Dusén 8 (W--1159395); Holway & Holway 1272 (W--1188243). São Paulo: Campos Novaes 916 (W--389887); A. Carvalho s.n. [Herb. Inst. Bot. S. Paulo 190] (W--1592285). BOLIVIA: Cochabamba: Cárdenas 3019 (W--1594061). La Paz: Julio 49 (W--1192637). PARAGUAY: Morong 128 (W--1417048). URUGUAY: Kuntze s.n. [Montevideo, 7/12/1891] (W--700691). CHILE: Valdivia: Claude-Joseph 2616 (W--1198543). Province undetermined: Claude-Joseph 1286 [Ramon] (W--1059300). ARGENTINA: Buenos Aires: Pedersen 349 (W--2122390). Corrientes: Pedersen 1911 (W--2283117). La Rioja: T. Meyer 4245 (W--1909186). Mendoza: Miers s.n. [Mendoza] (W--1421161); Semper 293 (W--2049690). Santiago del Estero: Luna Risso 4 (Gg--352667, N, N), 49 (N); Pierotti s.n. [Quebrada Tazana, April 4, 1944; Herb. Inst. Miguel Lillo 100888] (S). Tucumán: Bailetti 233 [Herb. Inst. Miguel Lillo 31392] (N); Gillegan & Ros s.n. [9 octubre 1950] (N); Venturi 50 [Herb. Inst. Miguel Lillo 31391; Herb. Osten 17263] (N, Ug). REPUBLIC OF SOUTH AFRICA: Cape of Good Hope: E. G. Bryant 1098 (Ka--92330); C. N. Lake s.n. [3-4-1922] (S). Natal: J. M. Wood 12122 (Vt). Transvaal: Repton 1300 (Z); Rodin 3917 (Ca--802719); Schlieben 7691 (N, W--2272478). MADAGASCAR: Cours 863 (P); Decary 17970 (P, S), 18178 (P). POLYNESIA: Hawaiian Islands: Oahu: A. A. Heller 2046, in part [Oahu] (Ca--104819); M. A. King s.n. [Oahu, 1902] (Ca--73591). CULTIVATED: Brazil: Dusén 8 (S). Maryland: McCann s.n. [9-15-36; seed from Brussels] (Md), s.n. [9-15-36; seed from Montevideo] (Md).

VERBENA BRASILIENSIS var. SUBGLABRATA Moldenke, Phytologia 3: 278. 1950.

Bibliography: Moldenke, Phytologia 3: 278 & 290. 1950; Moldenke, Résumé 121 & 471. 1959.

This variety differs from the typical form of the species in having its branches and stems glabrous or subglabrate and shiny, its inflorescences uniformly twice furcate, the primary peduncles

glabrous or subglabrate, the secondary peduncles and rachis puberulent, the bractlets non-ciliate, very minutely and obscurely puberulous or glabrescent, the calyx very minutely puberulent and not at all strigose.

The type of the variety was collected by Ernesto Barros Valenzuela (no. 8050) at San Fernando, Colchagua, Chile, on February 7, 1930, and is deposited in the Britton Herbarium at the New York Botanical Garden. The variety is known thus far only from the type specimen.

Citations: CHILE: Colchagua: Barros Valenzuela 8050 (N--type).

VERBENA CABRERAE Moldenke, *Phytologia* 1: 478--479. 1940

Bibliography: Moldenke, *Phytologia* 1: 478--479 (1940) and 1: 511. 1941; Moldenke, *Lilloa* 6: 325. 1941; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 44 & 101. 1942; Moldenke, *Lilloa* 10: 346 & 382. 1944; Moldenke, *Alph. List Cit.* 1: 84. 1946; Hill & Salisb., *Ind. Kew. Suppl.* 10: 242. 1947; H. N. & A. L. Moldenke, *P1. Life* 2: 52. 1948; Moldenke, *Castanea* 13: 117. 1948; Moldenke, *Alph. List Cit.* 2: 375, 575, & 599 (1948), 3: 808 & 908 (1949), and 4: 1077 & 1090. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 97, 105, & 197. 1949; Moldenke, *Phytologia* 3: 135 (1949) and 3: 290 & 305. 1950; Moldenke, *Inform. Mold. Set* 49 *Spec.* 3. 1954; Moldenke, *Résumé* 115, 126, & 471. 1959; Moldenke, *Résumé Suppl.* 2: 5. 1960.

Perennial, prostrate, creeping or semi-creeping herb; stems and branches slender, obtusely tetragonal, rather sparsely appressed-pilose with whitish hairs, more densely so toward the apex and on younger parts; nodes annulate; principal internodes 2--4 cm. long; leaves decussate-opposite, usually with several smaller ones on very much abbreviated twigs in their axils; petioles slender, 5--10 mm. long, winged, white-strigose; leaf-blades very thin-chartaceous, uniformly green on both surfaces, ovate in outline, 3--6 cm. long and wide, deeply 3-parted to the base, the divisions laciniate or pinnatifid, the lobes oblong and acute (often sharply so), strigose-pilose with appressed whitish hairs on both surfaces; midrib and secondaries plane or subimpressed above, prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence terminal; peduncles very slender, appressed-strigose, 2.5--4.5 cm. long; spikes abbreviated, congested, many-flowered; flowers perfumed or odorless; calyx narrow-tubular, about 9 mm. long and 1 mm. wide, densely white-strigose; corolla varying from violet, rose-violet, violet-blue, or violet-white to clear-lilac, rose-lilac, blue-lilac, lilac-white, purple, or even vivid rose-red, its tube about 12 mm. long, the limb mostly blue, 7--9 mm. wide.

The type of this species was collected by Angel Lulio Cabrera (no. 4199) -- in whose honor it is named -- at Quebrada del Río Caraparí, department of Orán, Salta, Argentina, on July 15, 1937, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is most distinctive, and has been collected in anthesis from February to May, July, August, October,

and November, at altitudes of 410 to 1200 meters. It has been found in quebradas, in fertile soil at the edge of cultivated ground, in savanna formations, in sandy loam od savannas, and in very sandy soil, especially in swamps. A vernacular name is "verbena crespa". Jørgensen reports it as "abundant" in the province of Formosa, while Hunziker says that it is "rather frequent" in Salta and "abundant in falda" in Buenos Aires. Meyer, on the label of his no. 678, from Chaco, says "abundant at edge of roads, embankments, etc., odorless", but on the label of no. 678a says "very rare, perfumed". Both collections were identified as "Verbena tenuisecta Briq. forma" by Osten. The Venturi 4607, cited in Lilloa 6: 325 (1941) as V. cabreræ is actually the type collection of V. lilloana Moldenke; it was originally identified as "Verbena erinoides Lam. aff." and is the basis for the Tucumán records listed by me for V. cabreræ in previous publications.

Herbarium material of V. cabreræ has been misidentified and distributed in herbaria as V. calliantha Briq.

In all, 24 herbarium specimens, including the type, have been examined by me.

Citations: BOLIVIA: Santa Cruz: Cárdenas 4617 (W-2027163), 5235 (W-2250761); Peredo s.n. [Capital, 27.III.1946] (S, S), s.n. [Las Luntas, 20.I.1947] (Gg--353270, N); Steinbach 2533 [Herb. Osten 14799] (Ug), 2673 [Herb. Osten 14801] (Ug), 5444 [Herb. Osten 16227] (Ug). ARGENTINA: Buenos Aires: A. T. Hunziker 3861 (S); Pastore 1163 (Go). Catamarca: Pierotti s.n. [La Merced, 19-V-1944] (N). Chaco: T. Meyer 678 [Herb. Osten 22702] (Ug), 678a [Herb. Osten 22701] (Ug). Formosa: Jørgensen 2470 [Herb. Inst. Miguel Lillo 31725; Herb. Osten 14554] (N, Ug). Salta: Cabrera 4199 (N--type); A. T. Hunziker 1212 (W-1804100); Pierotti 6556 (N); Schreiter 3821 [Herb. Inst. Miguel Lillo 31492] (N); A. G. Schulz 5299 (Cb), 5337 (Z). Santiago del Estero: Ruiz Huidobro 3079 (Gg--353272, N).

VERBENA CALIFORNICA Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79. 1942.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 79, 80, & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Alph. List Cit. 2: 559. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 27 & 197. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Résumé 33 & 471. 1959; Moldenke, Résumé Suppl. 3: 29. 1962.

Herb, to about 60 cm. tall; stems several, erect, rigid, rather sharply tetragonal, rather densely hispid-hirsute toward the base with stiff white hairs 1--2 mm. long, less so toward the apex; principal internodes 2--4 cm. long; leaves decussate-opposite, sessile, clasping at the base, remaining bright-green even in drying; leaf-blades firmly chartaceous, rather rigid, oblanceolate-elliptic, 1.7--4 cm. long, 5--10 mm. wide, acute or subacute

at the apex, irregularly serrate with obtuse or subacute, more or less appressed, antrorse teeth except toward the base, attenuate with rather straight and subparallel margins to the rather broad clasping base, decidedly revolute along the margins from base to apex, harshly scabrous and rather densely hispid with long white bulbous-based hairs on both surfaces, especially above, the hairs eventually deciduous and leaving the bulbous bases, the hairs shorter and sparser beneath except on the midrib and larger veins (where the hairs are, however, not bulbous-based); midrib and the few ascending secondaries impressed above, very prominent beneath; veinlet reticulation usually obscure or indiscernible above, often slightly prominulous beneath; inflorescence terminal, spicate; spikes usually in 3's, the outer ones often again singly branched, the floriferous portion 14--35 cm. long, straight, stiff, erect, densely many-flowered, the short peduncles and elongated rachis similar to the stems in all respects, but usually much more shortly pubescent except at the base; bracts several, foliaceous, oblong, 1 cm. long or less, 2--3 mm. wide, firm, scabrous and hirsutulous, with prominent midrib beneath and revolute margins; bractlets ovate-lanceolate, 3--3.5 mm. long, 1.5--2 mm. wide, long-acuminate at the apex, scabrous and short-hirsutulous, ciliate-hirsutulous on the margins, at least toward the base, about equaling the fruiting-calyx or slightly shorter; flowers not known; fruiting-calyx light, tubular, 3.5--4 mm. long, 1.5--2 mm. wide, lightly scabrellous-hirsutulous; cocci oblong, about 2 mm. long, the dorsal surface brown and reticulated, the ventral surface densely beset with appressed white strigulae except at the base and apex.

The type of this species was collected by Robert Francis Hoover (no. 3870) three miles north of Keystone, Tuolumne County, California, on September 30, 1938, and is deposited in the herbarium of the University of California at Berkeley. The species has been collected at an altitude of 1300 feet, flowering and fruiting in June and July, but I have not as yet had time to dissect the flowers. Herbarium material has been misidentified and distributed as V. carolina L. and V. polystachya H.B.K. In all, 5 herbarium specimens and 2 mounted photographs, including the type, have been examined by me.

Citations: CALIFORNIA: Tuolumne Co.: Belshaw 2357 [Herb. U. S. Dept. Agr. Forest Serv. 16881] (Ca--124399); Hoover 2382 (Ca--766949), 3870 (Ca--type, N--isotype, N--photo of type, Z--photo of type). CULTIVATED: California: Belshaw s.n. [May 25, 1937] (Ca--565360).

VERBENA CALLIANTHA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059--1060. 1904.

Synonymy: Verbena erinoides Chod. (in part) ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059, in syn. 1904 [not V. erinoides Auth., 1959, nor Hook., 1959, nor Hook. & Arn., 1959, nor L., 1959, nor Lam., 1791, nor Poepp., 1847, nor Spreng., 1830,

nor Willd., 1947]. Verbena chamaedryfolia x tenuisecta Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059, in syn. 1904. Verbena calliantha var. genuina Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1060. 1904. Verbena melindroides x tenuisecta Osten ex Moldenke, Résumé 369, in syn. 1959. Verbena chamaedryfolia var. bipinnatisecta Kuntze ex Moldenke, Résumé 362, in syn. 1959.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059--1060. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 10: 481--482. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Prelim. Alph. List Invalid Names 45. 1940; Moldenke, Suppl. List Invalid Names 8. 1941; Moldenke, Lilloa 6: 325--326 (1941) and 8: 429. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41, 44, & 101. 1942; Moldenke, Alph. List Invalid Names 46. 1942; Moldenke, Lilloa 10: 346 & 382. 1944; Moldenke, Alph. List Cit. 1: 16 & 263 (1946) and 2: 374, 375, 378, & 384. 1948; Moldenke, Castanea 13: 118. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 97, 99, 105, & 197. 1949; Moldenke, Alph. List Cit. 3: 660, 693, 732, 746, 863, 908, & 913 (1949) and 4: 1089, 1090, & 1152. 1949; Moldenke, Phytologia 3: 134 & 135 (1949), 3: 290 (1950), 3: 453 (1951), and 5: 96. 1954; Moldenke, Inform. Mold. Set 49 Spec. 3 (1954) and 51 Spec. 4. 1956; Moldenke, Résumé 109, 115, 118, 126, 350, 362, 363, 369, & 471. 1959; Moldenke, Résumé Suppl. 1: 7. 1959; J. A. Clark, Card Ind. issue 26. n.d.

Suffrutescent herb, to 1 m. tall, usually much less; stems ascending, medium-stout, green, branched, more or less pilose-pubescent with antrorse hairs; branches ascending; middle internodes 3--8 cm. long; leaves decussate-opposite; petioles to 2 cm. long, shorter than or subequaling the lamina, antrorsely pilose-pubescent; leaf-blades green on both surfaces, ovate in outline, about 4 cm. long and 3 cm. wide, obtuse or subobtuse at the apex, palmately subpinnate-laciniate with obtusely incised-crenate often wider segments, broadly cuneate at the base and prolonged into the petiole, sparsely substrigose-pubescent with antrorse hairs above, more densely appressed-pubescent beneath; venation slightly impressed above, more or less prominulous beneath; inflorescence terminal, spicate; peduncles elongate, 3--15 cm. long; spikes congested, eventually to 5 cm. long; bractlets lanceolate, 4--5 mm. long, half as long as or subequaling the calyx, densely pubescent with antrorse hairs above; calyx long-tubular, about 10 mm. long, the tube about 8 mm. long, densely canescent-pubescent on the outside with straight antrorse hairs, rarely mixed with sessile black glands, at maturity enlarged-urceolate, the mouth oblique, the teeth lanceolate-subulate, the anterior ones longer and to 2 mm. long, the posterior ones shorter and 1--1.5 mm. long, all finally connivent; corolla hypocrateriform, varying from blue, violet, or lilac to rose, rose-carmine, or purple, showy, large, the tube surpassing the calyx-teeth by 5--6 mm., equal, cylindric, glabrous or subglabrous outside, the limb 8--9 mm. wide, spreading, the lobes broad, obcordate, the larger ones 3--4 mm. long and 4 mm. wide, the terminal emargination to 1 mm.

deep; style exerted 2--3 mm. beyond the calyx-teeth after anthesis, incrassate toward the apex and there subbilobed; seeds sub-linear-oblong, yellowish, 3--3.5 mm. long, 0.8 mm. wide, beautifully elevated-reticulate on the top.

The species is based on several collection made by Emil Hassler in Paraguay: no. 1782, collected on the campo at Sapucay in January, no. 3196, collected on the shores of Río Limpio in August, and no. 7615, collected in thickets near Concepcion in October, all deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva.

The species has been found by collectors in fields and campos, in "campo espinillar", along railroad tracks, on streambanks and riverbanks, and growing as a weed in cultivated fields. Pedersen says that in Corrientes he found it in a rather low pasture on rich black earth, very wet after rains, and in places flooded. Montes reports it as rare in Misiones. It has been found in anthesis from August to March, at altitudes of from 700 to 2700 meters. A vernacular name reported is "margarita". Meyer states that in Chaco it is frequent on railroad embankments, in abandoned soil, etc.

Briquet notes that "Le V. calliantha est voisin de V. tenuisecta, dont il se sépare très facilement par l'indument, le mode de division des feuilles et l'ampleur relative de leurs lobes, la forme des bractées et des dents calicinales etc." What appears to be a natural hybrid between this species and V. cabreræ is discussed herein under xV. argentina Moldenke.

Herbarium material of V. calliantha has been misidentified and distributed as V. chamaedryfolia Juss., V. cheitmaniana Moldenke, "V. erinoides Lam. aff.", and V. santiaguensis (Covas & Schnack) Moldenke. The Fiebrig & Osten s.n. [Herb. Osten 8063] was claimed by Osten to be a hybrid between no. 8062 (V. peruviana?) and no. 8064 (V. tenuisecta) and growing between them. Osten 9014 was growing, he says, with no. 9013 (V. tenuisecta), and was identified by him first as V. melindroides Cham. x V. tenuisecta Briq. and then as V. chamaedryfolia var. bipinnatisecta Kuntze (probably an error for "subpinnatisecta Kuntze"). His no. 9015, type of V. melindroides x tenuisecta, was growing among V. peruviana and V. tenuisecta.

The Santa Cruz, Bolivia, record for V. calliantha given by me in my Résumé and elsewhere is based on Peredo s.n. [Las Juntas, 20-I-1947] which now proves to be V. cabreræ instead. The Monetti s.n. [Herb. Inst. Miguel Lillo 31696] and Lillo 3989 [Herb. Inst. Miguel Lillo 31691] cited in Lilloa 10: 346 (1944) are actually V. lilloana Moldenke, and the Bailetti 231 [Herb. Inst. Miguel Lillo 31690] and R. Schreiter 2358 [Herb. Inst. Miguel Lillo 32760] are V. dissecta Willd., as are also the Zabala 116 [Herb. Inst. Miguel Lillo 38045] cited in Lilloa 10: 382 (1944) and the

T. Meyer 3094 cited in Lilloa 6: 326 (1941). On the other hand, Cabrera 3169, cited by me in my Alph. List Cit. 1: 84 (1946) as V. dissecta, is actually V. calliantha, while Venturi 5264, cited as V. calliantha in Alph. List Cit. 4: 1090 (1949), is V. dissecta.

It is perhaps worth noting here that the other part of V. erinoides Chod. is V. storeoclada Briq., while V. erinoides Auth. is V. dissecta Willd., V. erinoides Hook., Hook. & Arn., L., Poepp., and Spreng. are all V. berterii (Meisn.) Schau., V. erinoides Lam. is V. laciniata (L.) Briq., and V. erinoides Willd. is V. ciliata Benth.

In all, 32 herbarium specimens, including the type collections of all the names involved, and 2 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Schreiner 15 (Ja--46573); Schwacke s.n. [Herb. Saldanha 6326] (Ja--46578). BOLIVIA: Tarija: Pflanz 4056 (B, W--1341238). PARAGUAY: Fiebrig & Osten s.n. [Herb. Osten 8063] (N, Ug); Hassler 3196 [Macbride photos 24682] (Kr--photo of cotype, N--photo of cotype), 7615 (N--cotype); T. Meyer 16035 (N, W--2049913); Osten 9014 (Ug), 9015 (Ug); Pedersen 3240 (W--2283617); T. Rojas 2539 [Herb. Osten 18187] (N, Ug); A. G. Schulz 7789 (Cb). ARGENTINA: Catamarca: Brücher & Brücher s.n. [30/1/49] (S). Chaco: Cabrera 3169 (Ug); T. Meyer 141 [Herb. Osten 22664] (Ug); A. G. Schulz 1477 (N), 7945 (Z). Corrientes: Pedersen 1844 (Hi--193251, N, S, W--2283108); Ybarrola 542 (W--1931829). Formosa: Morel 1003 (N), 1214 (N). Misiones: Montes 2512 (W--1988288); D. Rodriguez 548 [Herb. Inst. Miguel Lillo 31367] (N). Salta: T. Meyer 4608 (Ca--906601). Tucumán: Olea 66 (Ca); Ruiz Leal 12618 (Ss); Venturi 3568 (S).

VERBENA CALLIANTHA var. MICROSOMA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1060. 1904.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1060. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 10: 482. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 101 (1942) and [ed. 2], 99 & 197. 1949; Moldenke, Résumé 118 & 471. 1959.

This variety differs from the typical form of the species in its smaller stature, being only 8--20 cm. tall, its smaller leaves, the blades of which are only 2 cm. long and 1 cm. wide, and their narrower segments, the shorter petioles, which are only 5 mm. long, the more slender peduncles, and the more reduced spikes.

The type of this variety was collected by Emil Hassler (no. 1272) in thickets near Cerro Pyta, Paraguay, in October, and is deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva. I have as yet seen no material of this plant and

suspect that it may be merely a depauperate ecotype of the species.

VERBENA CAMERONENSIS L. I. Davis, Nature Leaflet. Lower Rio Grande Valley Nature Club 1, pr. 1, [2--3]. August 14, 1941.

Synonymy: Verbena lundelliorum Moldenke, Phytologia 2: 24.

August 26, 1941. Verbena lundelliorum Moldenke ex A. M. Davis, Study Boscaje Palma Cameron Co. 42 & 61, sphalm. 1942.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 315. 1933; L. I. Davis, Nature Leaflet. Lower Rio Grande Valley Nature Club 1, pr. 1, [2--3] (1941) and pr. 2, [2--3]. 1941; Moldenke, Phytologia 2: 24. 1941; W. H. Camp, Tax. Ind. 4: item 385. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 18 & 34. 1942; A. M. L. Davis, Study Boscaje Palma Cameron Co. 31, 39, 41--43, & 61, pl. 10, mss. 1942; Moldenke, Alph. List Invalid Names 48. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13 & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Castanea 10: 40. 1945; Moldenke, Phytologia 2: 127 (1945) and 2: 160. 1946; G. L. Fisher, Am. Bot. Exchange List. 1946; Moldenke, Alph. List Cit. 1: 144 (1946) and 2: 518. 1948; Moldenke, Wrightia 1: 229--230. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 70. 1948; Moldenke, Alph. List Cit. 3: 678--681, 723, 764, & 785 (1949) and 4: 1111, 1213, 1218, 1254, & 1291. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 23, 32, & 197. 1949; Moldenke, Phytologia 3: 73. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 262 & 263. 1953; Moldenke, Résumé 28, 39, 369, & 471. 1959; Lewis & Oliver, Am. Journ. Bot. 48: 639--641. 1961.

Illustrations: A. M. L. Davis, Study Boscaje Palma Cameron Co. pl. 10, mss. 1942; Lewis & Oliver, Am. Journ. Bot. 48: 640. 1961.

Sprawling or prostrate perennial herb (when large), sometimes covering an area over 3 m. wide, or bushy upright and to 45 cm. tall (when small); stems decumbent to ascending, slender, branched, obtusely tetragonal, hirsute or rather abundantly hirsutulous with stiff white hairs about 1 mm. long; branches numerous, very slender, erect or ascending, obtusely tetragonal, more densely hirsutulous; principal internodes 4--10 cm. long; leaves decussate-opposite, numerous; petioles slender or very slender, 0.5--2.5 cm. long, hirsute or abundantly hirsutulous like the branches, slightly margined; leaf-blades thin-chartaceous or membranous, somewhat lighter green beneath or else light-green above and slightly gray-green beneath, ovate or ovate-deltoid, 1.1--7 cm. long, 0.7--5.3 cm. wide, acute or subacute at the apex, subtruncate or truncate-cuneate at the base and slightly attenuate or prolonged into the petiole at the center, coarsely and irregularly incised-dentate or serrate-dentate along the margins with blunt or subacute teeth, appressed-hirsute or sparsely scattered-pilose on both surfaces with appressed whitish hairs; inflorescence spicate, abbreviated and 2--6 cm. long during anthesis, densely many-flowered, the flowers closely imbricate before and during anthesis, somewhat more separated in fruit, elongated to

15 cm. in fruit, with few (usually 3 or 4, sometimes to 7) open flowers at any one time; peduncles (0.8--8 cm. long) and rachis very slender or filiform, more acutely tetragonal, hirsute or abundantly hirsutulous like the branches, often with shorter glandular hairs interspersed; bractlets linear-lanceolate or linear-attenuate, 6--8 mm. long, slightly shorter or longer than the calyx, setaceous at the apex, hirsute or densely puberulent, long-ciliate along the margins with stiff white hairs; calyx tubular, swollen, 5--8 mm. long, about 1.5 mm. wide, hirsute or somewhat puberulent and also sparingly hirsutulous with longer white hairs, not glandular; corolla small, inconspicuous, varying from light-purple or purple to rose-purple, lavender, or dark-lavender, barely protruding from the calyx, its tube 7--11 mm. long, the limb 2--8 mm. wide; cocci subcylindric with a broader base, about 3 mm. long, 0.5 mm. wide at the apex and about 1 mm. wide at the base, the commissural face practically reaching the apex, muricately scabrous; chromosome number: $n = 15$.

The type of this interesting species was collected by L. Irby Davis in a palm grove on the Southmost Plantation, Cameron County, Texas, in April, 1941, and is deposited in the herbarium of the University of Texas at Austin. The type of V. lundelliorum was collected by Cyrus Longworth Lundell and Amelia A. Lundell (no. 8698) -- in whose honor it was named -- in a clearing at the palm grove, south of Brownsville, Cameron County, Texas [in other words, at the same locality!], on May 4, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden. Lundell 10011 is said to have come from the type colony.

It is rather singular that both binomials proposed for this species should have been published in the same year, and even in the same month, and based on material from the same locality! Careful comparison of publication records, however, shows that Davis' name was actually published and distributed to botanists and botanical libraries twelve days before mine was, so his name must stand as the accepted name for the plant in question. This was pointed out by me in my booklets "The Known Geographic Distribution of the Members of the Verbenaceae and Avicenniaceae", pp. 13 & 101 (march 12, 1942) and "An Alphanumeric List of Invalid and Incorrect Scientific Names Proposed in the Verbenaceae and Avicenniaceae", p. 48 (March 14, 1942), and in Phytologia 2: 127 (January 4, 1945) and 160 (July 8, 1946). Anna May Tarrance Davis, in her thesis entitled "A study of Boscaje de la Palma in Cameron County, Texas, and of Sabal texana", pp. 31, 39, 41--43, & 61 (August, 1942), gives valuable additional information about this species and on pl. 10 a splendid illustration of it.

The species has been found by collectors on prairies, along roadsides, in woodlands, fields, and clearings, and on the ground of tennis courts, at altitudes of 20 to 3100 feet, blooming in every month of the year. In Texas it is said that March and April are usually the months of best bloom, and good fruit has been collected in July. In Mexico it has been found in fruit in June,

growing in sticky black non-wooded valley soil. Davis reports that the January and February spikes often look quite unlike the later ones "for they have as many as seven flowers open at one time, making a circle around the central mass of buds. Later elongated spikes have only three or four flowers open at one time. It is presumed that the heat causes the rather delicate corollas to be shed more rapidly." He states further that the species "is quite common in the 'rain forests' on the east slopes of the mountains in eastern San Luis Potosí and has been collected by the writer at Tamazunchale, Tancanhuitz, Xilitla and twenty miles south of Valles. It has also been collected twenty miles west of Artiguo Morelos, Tamaulipas in the same range of mountains. The plant is most often found in the shade where it tends to grow rankly with large thin leaves. In the open the plant grows more like V. ciliata and the leaves are smaller and thicker. In Cameron County, Texas one plant, growing in the open, covered an area ten feet across and showed extensive rooting at the nodes."

King calls it an "abundant weed in open sun" and "locally abundant in partial shade" in San Luis Potosí. Traverse describes the plant as growing "along roadsides at palmgroves on banks thrown up in road making, in light brown silt in Sabal texana - Celtis mississippiensis complex", while Cory reports it "frequent on grounds of tourist courts." King found it in fields with abundant weeds in open sun.

The Ecology Class Univ. Texas s.n. cited by me in Lundell, Fl. Texas 3 (1): 36 (1942) as V. delticola Small, as well as the Liebmann 11313 & 11314, Nealley 117 & 118, and Palmer 90 cited by Perry (1933) under that species, are actually V. cameronensis. Herbarium material of V. cameronensis has also been misidentified and distributed as V. aubletia L., V. canadensis (L.) Britton, V. delticola Small, and V. elegans H.B.K. Galeotti 777 is the type collection of V. teucრიifolia Mart. & Gal., but the sheet of it photographed by Macbride as his photograph no. 24699 is V. cameronensis; the real type of V. teucრიifolia is the sheet with this same number in the herbarium of the Jardin Botanique de l'Etat at Brussels, seen and photographed by me.

In a series of letters to me, Mr. Davis gives quite some information about this plant which probably should be recorded here. First, about the original publication of its name: "Before it was noticed that our Nature Club leaflet describing my pet Verbena contained several errors (one of them rather bad).....some 50 or more.....were mailed out to a first preferred mailing list which was.....made up mostly of friends and a few specialists. A second printing was then made and it is being sent to all those people and institutions interested in botany and of course to those who got the first one...." In the Taxonomic Index for 1941 Camp makes the entirely uncalled for caustic comment that "Because of certain Post Office laws our opinion of such media for the publi-

cation of new species cannot be expressed here."

Davis continues: "Verbena cameronensis is the first new species I ever found and I have delayed describing it for years while I was studying its variations and distribution. It is rather common in parts of Mexico....I have numerous photographs of it growing here and in different places in Mexico (some of these pictures show V. cameronensis growing in mixed beds with other species which thus show the characters most decidedly by contrast with better known species). I have considerable data on geographic and seasonal variation, and also a number of notes on differences with V. delticola to present later. I could not present this voluminous material in the original publication for reason of cost; consequently the rather unique method of publication was used....The 'vine-like' verbenas that occur naturally in Cameron County, Texas may be separated by the following scheme: V. quadrangulata has the corolla limb not more than 1/2 as wide as the calyx is long; V. cameronensis has the corolla limb usually exactly equal to the length of the calyx but may in extreme cases be 3/4 as wide as the calyx is long; and the others (V. ciliata, V. delticola, etc.) have the corolla limb considerably wider than the calyx is long." He goes on to say that the pubescence of V. cameronensis and V. delticola "is almost exactly the same even though the plants are so decidedly different in the field here that it seems impossible that the two could be confused. Except in very young plants the leaves of delticola tend to be much more irregular in outline than those of cameronensis here in Texas -- most plants have a number of leaves that are decidedly three-divided in delticola.... This difference will usually enable you to separate the plants without even looking at the blossoms. I find that in certain Mexican states the leaves of delticola become more regular in outline but there are probably enough other characters to readily separate the species. In the field cameronensis and delticola are easily separated by the differences in color or by the difference in appearance of the centers of the heads of the spikes when there are no blooms open...."

In another letter he says "The next big bend of the Rio Grande to the east of the Rabb bend is the Southmost bend. At the lower part of this bend we have the Southmost Plantation where there are also a number of Sabal groves. Although nearly all visitors from the north put in all their time set aside for our Sabal association at the Rabb area (because of its wide publicity I suppose), I think the Southmost area much more interesting. Several tropical plants that do not grow in the Rabb area are found in the Southmost bend. There V. cameronensis is quite common. It was noticed that the description of your V. lundellorum sounded exactly like V. cameronensis except for the flowers which were absurdly small for cameronensis. After studying it carefully my wife and I discussed it and decided it could not possibly be the

same as the corolla limb was only 2 mm. wide in your species. Last April [1941] we had made a study of the variation of cameronensis while on a trip into central Mexico....and found that plants growing very poorly on dry hillsides had corolla limbs of 6--7 mm.; so we felt that it would be impossible to have a corolla less than 6 mm. wide. That will be unfortunate if they really do turn out to be the same species even though yours does have such very small corollas. If they are the same it certainly must be that you have very poor material and insufficient amounts of it to properly study the species....I have been years at working out the details of that species and feel secure about it for all the taxonomists that I carefully sent specimens to always called it 'delticola'. As far as I can find it is the only verbena in certain places in Mexico."

In all, 58 herbarium specimens, including the types of all the names involved, and 9 mounted photographs and descriptions have been examined by me.

Citations: TEXAS: Cameron Co.: Cory 51353 (Ca--754842, Du--345338, N, Sm, W--1885955); L. I. Davis s.n. [Southmost, Spring '41] (Au--121838--type, F--photo of isotype, N--isotype, N--photo of isotype, Si--photo of isotype, Sm--isotype, Z--photo of isotype), s.n. [Southmost, Feb. 1, 1942] (N), s.n. [March 7, 1942] (N), s.n. [Southmost, March 22, 1942] (Gg--295228, M1, N, W--1828599), s.n. [Bayview, March 3, 1946] (Au--171996); Ecology Class Univ. Texas s.n. [Palm Grove, 3.1.30] (Au--121839); G. L. Fisher 41031 (Au--121837, Gg, S, W--1811794); C. L. Lundell 10771 (N, W--1926934); Lundell & Lundell 8698 (Ld, Mi, Mi, N, N--photo, Z--photo), 10011 (Ld, Mi, Mi, N, W--1888874), 10014 (Ld, Mi, Mi, N, W--1888876); Nealley 117 ["368"] (Up--17081, W--56207), 118 (Up--17081); R. Runyon 1943 (W--1734131); Traverse 1107 (Au--179110, W--2339918). MEXICO: Hidalgo: H. E. Moore 2917 (Ba); A. J. Sharp 441820 (O). Oaxaca: Liebmann 11314 (W--1315840). San Luis Potosí: L. I. Davis 213 (N); R. M. King 3983 (N, Z), 4249 (N); C. L. Lundell 12256 (N, W--1927026); R. L. Oliver 125 (Z); J. N. Weaver 667 (W--2134162), 677 (N). Tamaulipas: L. I. Davis 214 (N); Edw. Palmer 90, in part (Gg--31466, N, W--463027). Vera Cruz: Galeotti 777, in part [Macbride photos 24699] (Kr--photo, N--photo); Liebmann 11313 (W--1315091); Medellin 40 (Me). MOUNTED DESCRIPTIONS: L. I. Davis, Nature Leaflet. Lower Rio Grande Valley Nature Club 1: [2-3]. 1941 (Ur); Moldenke, Phytologia 2: 24. 1941 (W).

VERBENA CAMPESTRIS Moldenke, Phytologia 3: 117--118. 1949.

Synonymy: Timotocia chamaedrioides (Cham.) Mold. ex Moldenke, Résumé Suppl. 1: 23, in syn. 1959.

Bibliography: Moldenke, Phytologia 3: 117--118 (1949) and 3: 288. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 110 & 471. 1959;

Moldenke, *Résumé Suppl.* 1: 23. 1959.

Low herb; stems creeping, very slender, shortly appressed-pubescent; branches procumbent or ascending, very slender, rather obtusely tetragonal, rather sparsely appressed-pubescent; leaves decussate-opposite; petioles very slender, 1--3 mm. long, strigillose; leaf-blades chartaceous, uniformly bright-green on both surfaces, ovate in outline, 5--10 mm. long and wide, obtuse at the apex, acute or subcuneate at the base, 3-lobed with deep sinuses, each lobe rather irregularly incised with obtuse lobules, finely strigillose above and on the venation beneath; midrib, secondaries, and veinlets very slender, often subimpressed above, prominulous beneath; inflorescence terminal, spicate, the floriferous portion of the spikes dense, subcapitate when young, later elongating to 15 mm.; peduncles filiform, 1--4 cm. long, puberulent; bractlets narrowly elliptic, about 3 mm. long and 1 mm. wide, attenuate at the apex, ciliolate-margined; calyx tubular, about 4 mm. long, 5-angled, 5-costate, 5-apiculate, spreading-ciliolate on the angles; corolla hypocrateriform, blue, its tube about 4 mm. long, strigillose above the calyx, its lobes about 2 mm. long, emarginate at the apex, finely strigillose on the outside.

The type of this very distinct species was collected by Raulino Reitz (no. 2392) on a campo, at an altitude of 2000 meters, at Campos dos Padres, Santa Catarina, Brazil, on December 16, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been collected in anthesis also in January. Common names recorded for it are "camaradinha", "formosa sem dote", and "jurupeba" -- names, which, however, are applied to most other members of the genus in southern Brazil.

In all, 4 herbarium specimens, including the type, have been examined by me.

Citations: BRAZIL: Santa Catarina: Rambo 60168 (S); Reitz 2392 (N--type), 2505 (N), 2536 (N).

VERBENA CANADENSIS (L.) Britton, *Mem. Torrey Bot. Club* 5: 276. 1894.

Synonymy: Buchnera canadensis L., *Mant.* 88. 1767. Verbena aubletia Jacq., *Hort. Vindob.* 1: pl. 176, and 2: 82. 1772. Obletia Rozier, *Introd. Obs. Phys. Hist. Nat.* 1: 367, pl. 2. 1773. Verbena oblaetia Retz., *Svenska Vet. Akad. Stockh. Nya Handl.* 34: 143, pl. 5. 1773. Verbena obletia Medic., *Act. Acad. Theod.-Palat.* 3 (Phys.): 194, pl. 7. 1775. Anonymos caroliniensis Walt., *Fl. Carol.* 164. 1788. Verbena longiflora Lam., *Tabl. Encycl. Méth. Bot.* [Illustr.] 1: 57. 1791. Glandularia caroliniensis J. F. Gmel., *Syst. Veg.* 2 (2): 920. 1791. Billardiera explanata Moench, *Method.* 369. 1794. Verbena rubra Salisb., *Prodr.* 71. 1796. Verbena tetrandra, spicis solitariis; corollis fasciculatis; foliis cordatis, inciso-serratis L. f. apud Poir. in Lam., *Encycl. Méth. Bot.* 8: 547, in syn. 1808. Verbena (aubletia), tetrandra, spicis laxis, solitariis;

foliis trifidis, incisis Ait. apud Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Verbena (aubletia), assurgens, foliis variè dissectis; spicis solitariis, peduncularis, imbricatis, grandifloris Mich. apud Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Verbena (longiflora), spicis solitariis, densiusculis, corollarum laciniis emarginatis; foliis ovalibus inciso-serratis, petiolatis Lam. apud Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Buchnera (canadensis), foliis laciniatus, caule dichotomo L. apud Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Verbena anonyma Bart. ex Raf., Suppl. Fl. Ludovic. 139, in syn. 1817. Verbena aubletia Wild ex Raf., Suppl. Fl. Ludovic. 139. 1817. Glandularia carolinensis J. F. Gmel. apud Raf., Suppl. Fl. Ludovic. 139, in syn. (1817); Steud., Nom. Bot., ed. 1, 873. 1821. Verbena lamberti Sims in Curtis, Bot. Mag. 48: pl. 2200. 1820 [not V. lamberti Ker, 1827, nor Spreng., 1959]. Glandularia obletia Rozier ex Steud., Nom. Bot., ed. 1, 873. 1821. Verbena grandiflora Michx. ex Steud., Nom. Bot., ed. 1, 873, in syn. 1821 [not V. grandiflora Bodger, 1936, nor Ort., 1797, nor Sessé & Moc., 1889]. Verbena intermedia Penny ex G. Don in Loud., Hort. Brit. Suppl. 1: 602. 1832 [not V. intermedia Gill. & Hook., 1829]. Verbena lamberti Penny ex G. Don in Loud., Hort. Brit. Suppl. 1: 602. 1832. Verbena lamberti var. rosea Sweet, Brit. Fl. Gard., ser. 2, 4: 363. 1836. Verbena aubletia var. drummondii Lindl. in Edwards, Bot. Reg. 23: pl. 1925. 1837. Glandularia aubletia (Jacq.) Nutt., Trans. Am. Phil. Soc. 5: 184. 1837. Verbena drummondii Hort. ex Lindl. in Edwards, Bot. Reg. 23: pl. 1925, in syn. 1837. Verbena aubletia drummondii Lindl. ex G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839. Verbena lamberti rosea D. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839. Verbena drummondii Hort. ex G. Don in Loud., Hort. Brit. Suppl. 2: 680, in syn. 1839 [not V. drummondii Sweet, 1947]. Anonymos carolinensis Walt. apud Walp., Repert. 4: 31, in syn. 1845. Verbena aubletia L. apud Schau. in A. DC., Prodr. 11: 554. 1847. Verbena obletia Retz. apud Schau. in A. DC., Prodr. 11: 554, in syn. 1847. Verbena longifolia Lam. ex Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1259, in syn. 1873 [not V. longifolia Mart. & Gal., 1844]. Verbena montana Hort. ex Sieb. & Voss in Vilmorin, Blumeng., ed. 3, 1: 825, in syn. 1895. Verbena grandiflora Steud. ex Hook. & Jacks., Ind. Kew. 2: 1179, in syn. 1895. Verbena aubletia grandiflora Haage & Schmidt, Cat. Général 93. 1898. Verbena drummondii (Lindl.) Baxt. ex Small, Fl. Southeast. U. S., ed. 1, 1011. 1903. Verbena lambertii Sims ex Small, Fl. Southeast. U. S., ed. 1, 1011. 1903. Verbena canadensis Britton apud Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906. Verbena aubletia var. lamberti (Sims) M. E. Jones, Contr. West. Bot. 12: 78. 1908. Verbena canadensis var.

lambertii Thell., Fl. Advent. Montpel. 428. 1912. Verbena aubletia drummondii Lindl. ex Stapf, Ind. Lond. 6: 429. 1931. Verbena lambertii rosea D. Don ex Stapf, Ind. Lond. 6: 430. 1931. Verbena aubletia var. lamberti M. E. Jones apud Perry, Ann. Mo. Bot. Gard. 20: 343. 1933. Glandularia lambertii (Sims) Small, Man. Southeast. Fl. 1138 & 1508. 1933. Glandularia canadensis (L.) Small, Man. Southeast. Fl. 1139 & 1508. 1933. Glandularia drummondii (Lindl.) Small, Man. Southeast. Fl. 1139 & 1508. 1933. Verbena canadensis var. drummondii (Lindl.) Baxt. ex Junell, Symb. Bot. Upsal. 4: 11. 1934. Verbena canadensis var. atroviolacea Hort. ex Dermen, Cytologia 7: 161—163, fig. 10, 164, 165, fig. 26, 168, & 174. 1936. Verbena canadensis var. compacta Hort. ex Dermen, Cytologia 7: 161, 164, & 168. 1936. Glandularia drummondii (Hort. ex Baxt.) Small apud A. W. Hill, Ind. Kew. Suppl. 9: 124. 1938. Glandularia lamberti (Sims) Small apud A. W. Hill, Ind. Kew. Suppl. 9: 124. 1938. Verbena bracteosa Pursh ex Moldenke, Prelim. Alph. List Invalid Names 45, in syn. 1940 [not V. bracteosa Michx., 1803]. Anonymos caroliniensis J. F. Gmel. ex Moldenke, Prelim. Alph. List Invalid Names 5, in syn. 1940. Glandularia aubletia Nutt. ex Moldenke, Prelim. Alph. List Invalid Names 26, in syn. 1940. Verbena aublattia Jacq. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena aubletia var. compacta Hort. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena aubletia var. drummondii Lindl. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena aubletia var. grandiflora Hort. ex Moldenke, Suppl. List Invalid Names 7, in syn. 1941. Verbena drummondii Baxt. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena drummondii (Lindl.) Bart. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena drummondii var. montana Hort. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena canadensis L. ex Moldenke, Alph. List Invalid Names 46, in syn. 1942. Verbena canadensis var. lamberti Thell. ex Moldenke, Alph. List Invalid Names 46, in syn. 1942. Verbena aublettia Roig, Plant. Medic. Cuba 671 & 811, sphalm. 1945. Büchnera canadensis L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 3, in syn. 1947. Glandularia aubletia Gmelin ex Moldenke, Alph. List Invalid Names Suppl. 1: 9, in syn. 1947. Glandularia canadensis XYZ ex Moldenke, Alph. List Invalid Names Suppl. 1: 9, in syn. 1947. Glandularia lamberti Small ex Moldenke, Alph. List Invalid Names Suppl. 1: 10, in syn. 1947. Glandularia obletia Rozier ex Moldenke, Alph. List Invalid Names Suppl. 1: 10, in syn. 1947. Verbena aublattia Roig ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena aubletia Ait. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena aubletia (L.) Britton ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena

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Erect or ascending herb of spreading habit, to 60 cm. tall,
 annual in the northern part of its range, perennial in the south-
 ern part; roots fibrous; rhizomes sometimes present; bark green;
 stems decumbent or ascending, slender, 3--6 dm. long, rooting at
 the lower nodes, more or less branched, spreading-hirsute or
 glabrate; leaves very variable in shape, the blades membranous,
 ovate to elongate-ovate or ovate-oblong, 2.5--9 cm. long, 1.5--4
 cm. wide, acute or acuminate at the apex, truncate or cuneate at
 the base and narrowed into the margined petiole, varying from in-
 cised or incised-pinnatifid to 3-cleft, appressed-hirsute or
 glabrate on both surfaces; spikes pedunculate, fascicle-like or
 depressed-capitate during anthesis, elongating in fruit; bract-
 lets shorter than or occasionally as long as the calyx, linear-
 attenuate, hirsute, usually ciliate; flowers fragrant or odor-

less, about 1.3 cm. wide; calyx glandular-hirsute, 10--13 mm. long, its lobes very slender, subulate-setaceous, unequal, the posterior one much shorter; corolla varying from rose, rose-pink, rose-purple, pink, light-pink, light rosy-magenta, or magenta to lavender, bright-lavender, lilac, pinkish-lavender, phlox-lavender, orchid-colored, soft pale blue-violet, reddish-violet, purplish, purple, or blue, sometimes variegated, often lavender or purple with a reddish eye, its tube about twice as long as the calyx, varying from glabrous to finely pubescent or glandular on the outer surface, its limb sometimes orchid-purple (HCC.31), 11-15 mm. wide, the lobes 5, emarginate; anther-connectives with large glands or glandless; schizocarp constricted along the lines of cleavage at maturity; cocci 3--3.5 mm. long, subcylindric with a slightly broadened base, reticulate-scribulate from the apex to the base, the commissural faces muricate-scabrous; chromosome number: $2n = 30$.

This common species grows from Illinois to Tennessee, southern Pennsylvania, Virginia, and Florida west to Colorado and Texas, and has been naturalized in Michigan and Minnesota, and is widely cultivated. It is a very variable and polymorphic species. Names have been given to various forms, but they do not seem to be sufficiently constant to warrant nomenclatural designation. In the horticultural trade, for instance, plants with dark-violet corollas are known as var. atropurpurea; those with compact habit are var. compacta; those with especially large corollas are var. grandiflora; those with bipinnatifid leaves and the calyx only 10 mm. or less in length are var. drummondii; and those with narrow pinnatifid lanceolate or ovate-lanceolate leaves, cuneate at the base, and the calyx 12 mm. or more in length are var. lamberti (lamberti rosea is said to have paler, fragrant, larger flowers). Typical V. canadensis has pinnatifid broadly ovate to deltoid leaves, cordate or broadly truncate at the base, the calyx 12--13 mm. long. Small differentiates these forms (as species) from their near relatives as follows:

1. Corolla rose-purple, pink, or white.
2. Leaf-blades toothed, incised, lobed, or pinnatifid, the segments broad.
3. Tip of the longer calyx-lobes subulate, 1 mm. long.....V. maritima.
- 3a. Tip of the longer calyx-lobes bristle-like, 2--3 mm. long.
4. Leaf-blades pinnatifid or incised-pinnatifid; cocci 2.5-3 mm. long, stout, pitted from near the base to the apex.
5. Leaf-blades once pinnatifid; calyx 12 mm. long or longer.
6. Leaf-blades lanceolate to ovate-lanceolate, cuneate at the base.....V. lambertii.
- 6a. Leaf-blades broadly ovate to deltoid, cordate or broadly truncate at the base.....V. canadensis.
- 5a. Leaf-blades bipinnatifid; calyx 10 mm. long or less..

- V. drummondii.
- 4a. Leaf-blades serrate or incised-serrate; cocci about 4 mm. long, slender, pitted from about the middle to the apex.....V. tampensis.
- 2a. Leaf-blades pinnatisect, the segments narrowly linear to subulate.....V. tenuisecta.
- 1a. Corolla red.....V. peruviana.

Among the numerous common names recorded for V. canadensis are the following: "clump berbena", "clump verbena", "clump vervain", "common verbena", "common wild verbena", "cut-leaves rose vervain", "cut-leaved vervain", "flowering verbena", "Lambert's vervain", "large flowered verbena", "large-flowered verbena", "large flowering verbena", "large flower verbena", "perennial verbena", "pobladora", "pobbeeten", "purple-flowered verbena", "purple verbena", "Rocky Mountain vervain", "rose-coloured vervain", "rosenrotes Eisenkraut", "rose verbena", "rose vervain", "small-flowered verbena" [surely in error!], "sweet William", "verbena", "verbenen", "verbenia", "vervain", "verveine à bouquet", "verveine à bouquets", "verveine citronnelle", "verveine de Drummond", "verveine de Miquelon", "verveine de Miquelon naine magenta", "verveine de Miquelon naine rose", "verveine des Indes", "verveine du Canada", "verveine du Pérou", and "wild verbena". It must be pointed out, however, that the names "verbena" and "vervain" are applied to many other species of the genus -- and to the genus as a whole -- as well as to species of related genera [see under V. bonariensis L.]. Specimens have been misidentified and distributed in herbaria as V. ambrosifolia Rydb., V. angustifolia Michx., V. bipinnatifida Nutt., V. bipinnatifida Nutt., V. bracteosa Michx., V. chamaedrifolia Juss., V. ciliata Benth., V. denticola Small, V. erinoides Lam., V. halei Small, V. hybrida var. compacta Hort., V. macdougallii Heller, V. officinalis L., V. phlogiflora Cham., V. pumila Rydb., V. stricta Vent., V. tampensis Nash, V. venosa Gill. & Hook., and V. xutha Lehm.

The V. bracteosa x urticifolia of Eggert, of Rydberg, and of Stevens are all xV. perriana Moldenke; V. lamberti Ker is V. elegans H.B.K.; V. lamberti Spreng. is V. lasiostachys Link; V. aubletia var. maritima Curtiss is V. maritima Small; V. aubletia Jacq. x V. tenera Spreng. is xV. wingei Moldenke; and V. canadensis var. ehrenbergii Thell. is V. elegans H.B.K.

Rttmpler (1873) calls this plant "Aubletiaartiges Eisenkraut", "verveine de Miquelon", "verveine à bouquets", and "Aubletia-like vervain". His description is "Einjährig.-- Mehr oder weniger steifhaarige, von Grund auf verästelte Pflanze mit vierkantigen, ausgebreiteten, dann aufrechten, 30--50 Centimeter hohen Aesten. Blätter gegenständig, stark genervt, länglich-eirund, halbgefiedert, mit 3 ungleich gezähnten Lappen. Blüthen zahlreich, sitzend, in Anfangs mehr oder weniger dichten und doldenförmigen, dann

verlängerten Aehren; Kelch behaart, röhrig, gegen 1 Centimeter lang, mit 5 kleinen Zähnen und mit einem linienförmigen Beckblättchen; Blumenkrone fast schalenförmig, die cylindrische Röhre länger als der Kelch; Saum eben, dunkel-amaranthrosa, in 5 Lappen getheilt, von denen 3 grösser; im Schlunde ein kleiner Kranz weisser Haare; Staubgefässe 4 oder 5, eingeschlossen; Griffel dünn, ebenfalls von der Röhre eingeschlossen."

He separates on page 1260 var. drummondii Hortorum (which he calls "lilafarbige Abart" as follows: "Unterscheidet sich von der vorigen nur durch ihre violett-lilafarbigen Blumen, welche zu gewissen Stunden des Tages schwach duften."

Of the species he says "Diese Verbene und ihre Abart sind durch den Reichthum und die Dauer ihres Flors ausgezeichnet, welcher in Juni beginnt und je nach der Zeit der Aussaat sich bis zum Oktober verlängert. Sie sind zur Bildung kleiner und grossen Gruppen, zur Ausschmückung der Rabatten, wie auch zur Anlage hübscher Einfassungen sehr beliebt. Man säe sie: -- 1. Im März-April in das Mistbeet, pikire sie in das Mistbeet oder in Töpfe, die man in das Mistbeet zurückstellt, und pflanze sie zum Bleiben im Mai-Juni, oder auch auf das Reservebeet, um sie, wenn sie blühen wollen, mit dem Erdballen auszuheben und an den Platz zu pflanzen. -- 2. Im September auf ein Gartenbeet; man pikire die Pflänzchen in Schalen, die man unter Glasfenstern überwintert und pflanze sie im Mai mit 40--50 Centimeter allseitigem Abstände an den Platz."

The J. B. H. s.n. [Bad Lands, June 1886], Carleton 177, Demaree 12003, Geyer 107, C. S. Sheldon 323, B. B. Smyth 306, L. F. Ward s.n. [Fort Worth, Sept. 9, 1877], and C. Wright 1502, distributed as V. aubletia or V. canadensis, are actually V. bipinnatifida Nutt.; T. S. Brandege 5, J. M. Coulter s.n. [Denver, May 17, 1873], J. H. Cowen 403 & s.n. [Florence, June 14, 1892], and O. B. Metcalfe 1090 are V. ambrosifolia Rydb.; S. B. Parish s.n. [July 1882] is V. ciliata Benth.; Goldman 42, C. R. Orcutt 1191, Pringle 11843, and Tharp 1826 are V. delticola Small; J. E. Johnson s.n. [s. Utah, 1876], Lemmon & Lemmon s.n. [Peach Springs, June 1884], C. T. Mohr s.n. [Gila River, Feb. Mar. 1873] & s.n. [Plains of Sonora, 20-29-80], Edw. Palmer s.n. [Southern Arizona, 1869], Purpus 6061, and Toumey 305a & s.n. [Grapevine Cañon, July 30, 1891] are all V. gooddingii Briq.; Griffiths 3489, Hough s.n. [Sabina Cañon, April 4, 1896], Edw. Palmer 307, C. C. Parry 551 (in part), M. E. Spencer 92, Toumey s.n. [Camp Verde, Aug. 7, 1891] & s.n. [Sabina Cañon, April 4, 1896], and G. R. Vasey s.n. [Tucson, 1881] are all V. gooddingii var. nepetifolia Tidestr.; and Parry, Wright, & Schott s.n. [Frontera, Mar. 22, 1852] is a cotype collection of V. wrightii A. Gray, while A. Baker 20, H. Manning 33, and S. Taylor 27 are V. tenuisecta Briq.; J. I. Carlson s.n. [Douglas, May 13, 1915] is V. ciliata Benth. or V. ambrosifolia f. eglandulosa Perry; Liebmann 11313 & 11314 and Nealley 117 are V. cameronensis L. I. Davis; Tharp 5602 is V. ciliata

var. longidentata Perry; E. J. Palmer 11843 is V. pumila Rydb.; C. Thomas s.n. [Colorado Terr., 1869] is in part V. bracteata Lag. & Rodr. and in part V. ambrosifolia Rydb.; Collector undesignated s.n. [Partridge Creek, April 26] is in part V. gooddingii Briq. and in part V. ciliata var. pubera (Greene) Perry; and C. H. M. Barrett 13, Beckwith 772, and Mattern & Mattern s.n. [Titusville, March 31, 1914] are V. tampensis Nash.

Four hybrids involving this species are known thus far: V. canadensis crossed with V. ambrosifolia f. eglandulosa Perry is xV. fecunda Moldenke, crossed with V. bipinnatifida Nutt. is xV. oklahomensis Moldenke, crossed with V. racemosa Eggert is xV. ferax Moldenke, and crossed with V. tenuisecta Briq. is xV. wingei Moldenke. I regard the V. canadensis var. compacta x ambrosifolia f. eglandulosa Derman and the V. canadensis var. atroviolacea x ambrosifolia f. eglandulosa Derman as xV. fecunda, too, and the V. canadensis var. compacta x racemosa Derman and the V. canadensis var. atroviolacea x racemosa Derman as xV. ferax. The V. canadensis var. candidissima Haage & Schmidt is treated by me under V. canadensis f. candidissima (Haage & Schmidt) Palmer & Steyerl., which see.

Bartram (1791) found V. canadensis at Pointe Coupée, Louisiana, and describes it on page 436 (not "136" as stated by Rafinesque, Suppl. Fl. Ludovic. 139. 1817) of his "Travels" as follows: "here is likewise a new and beautiful species of Verbena, with decumbent branches and lacerated deep green leaves; the branches terminate with corymbi of Violet blue flowers, this pretty plant grows in old fields where there is good soil" and blooms in Autumn.

The species was introduced into cultivation in or about 1770. It has been found growing at altitudes of 30 to 2800 feet, blooming from January to October, and fruiting from February to October. It has been found by collectors in deep sand, sandy loam, heavy loam, Carrizo sand, clay loam, limestone and gravelly limestone, red clay, red sand, and sandy or loam soil in general, in dry drained land and rocky ground, on dry or open prairies, sand hills, granite outcrops, dry shale bluffs, and rocky cliffs and ridges, in old or open and waste fields, rocky or cedar barrens, limestone quarries, and cultivated or sandy abandoned fields, on low wooded or rocky clay hills, in cedar and open cedar glades, on dry banks and knolls, limestone barrens and hillsides and open slopes, in wet meadows and gravel clay soil, on sandy or rocky dry ridges, along railroad tracks and railroad embankments, in rich or moist sandy woods and oak-elm woods, in open and dry open or sandy open ground, on novaculate ridges and high hills or bottoms, in valley land or gravel-clay soil, on ridges and bluffs, dry fertile ridges, or rocky clay soil, along log train tracks, on rocky-sandy banks or roadside ditch banks, in orange groves and sandy woodlands, on low hills,

dunes, and limestone ridges or hills and bluffs, limestone thickets and quarries, along roadsides and roadside ditches, at the edges of fields and prairie pastures, in grasslands and hammocks, along sloughs, in stubble fields and rocky woods, on open banks and nepheline syenite, in yards and sterile oak thickets, in dry bottoms and upland pinelands, in waste places and clay barrens, in sandy or moist sandy woods and sandy post oak woods, at the borders of woods, on forested hillsides and rocky open hillsides, as well as in wet swaley meadowy glades, sandy or sandstone slopes, cut-over pine-oak woods, and deep moist sandy woods. It is said to be abundant on prairies, in fields, thickets, woods, and pinelands, open woods and cultivated ground, along rich clayey and sandy clay or clay-loam roadsides, on sandy hills, in hillside woods, on dry ridges or dry rocky and sandy ridges, on rocky hillsides and rocky fertile hillsides, in meadows and dry waste land, on low wooded hills and igneous intrusive areas, in rocky woods and cleared thickets, in bogs and cemeteries, on rocky mountain and open sunny slopes, in open dry pastures, in gravel soil or fine sandy loam soil and dry upland soil, on floodplains and roadside clay banks, in pastures and fallow open gravelly fields, on dry sterile banks in oak-hickory woods, in the dry soil of cemeteries, on low ridges and dry rocky hills, and in the foothills. Chase calls it a "weed" in cornfields in Illinois, while Jones (1945) says that it grows in open woods from Menard County southward, blooming from May to August there. Doellinger, Moore, & Barkley found it "on Boone limestone, Eureka formation". In Kansas Hale says it grows along roadsides and in rocky places, while Bailey & Bailey refer to it as "common and showy" there. Houghton found it to be "common in open forest" in Oklahoma, while Faulkner says it inhabits "grassland pastures and woods" there. Fox reports that in Louisiana it is found in "mixed forests, open places in woods, and along roadsides", while Ewan says it is "locally frequent in swampy woods" there.

Gates (1940), in his "Flora of Kansas", states that it is found in "prairies, fields and rocky hillsides" mostly in the eastern third of the state, but also at scattered locations in the west. He calls it a hemicryptophyte. Mackenzie affirms that it is common in the barrens of Missouri. Runyon states that it is "abundant in Cameron County [Texas]; it covers large areas of open ground and fields; flowers in terminal panicles; leaves dissected into many lobes; fruit a cylindrical capsule." His no. 2625 has flowers rather small for this species -- he describes its leaves as "nearly trifid, ovate in outline" and says it is "occasional along the highway in Hidalgo County." Rose-Innes & Warnock state that the species grows in "disturbed sandy soil along roadsides" in Texas, while Furlong describes it as "occasional in sandy roadsides" and Marsh reports it "common in woods under trees" there. In Oklahoma it was found by Hopkins in a "dry sterile field in clearing of oak-hickory forest", while Waterfall found it "in clay and shale in crevasses of mountainside" and "in sand at edge of post oak woods". Godfrey says that it inhabits grassy strips

along open fencerows, grassy open bottomlands, and pine woodlands in Florida. In Iowa it grows among viney pea, wood-sorrel, and violets according to West, while in Alabama it is said by Cooley and the Harpers to be "not common on steep bluffs". Huss found it in sand in the "little bluestem association" in Texas.

The type of V. aubletia grandiflora is Haage & Schmidt 5917, collected in cultivation at Erfurt, Germany, in 1898 or earlier.

The Deam 24736 and Ek s.n. [October 3, 1936], from Indiana, are both said to be "escaped from cemeteries", and Gates 13773, from Cheboygan County, Michigan, has a note on the label stating that it was "apparently escaped from cultivation". Schnack reports that "this verbena is common along the track from St. Louis to Galveston", but his April 13, 1880, collection was "escaped from front yard" in Wabash County, Illinois. Davis & Davis report that it is "a hardy creeping rockgarden verbena bought as V. venosa" and cultivated at Morgantown, West Virginia. It apparently escapes from cultivation in other countries, too, because Gibbes found it on "hills n.e. of Hamburg", Germany, and Beauregard reports it "in cult. fields" in France. Hegi (1927) says "verwildert in der Mark Brandenburg unweit Nauen." Jansson's collection from Connecticut, apparently from escaped material, bears a note "native in the southwestern states."

The L. H. Bailey s.n. [Sept. 30, 1926] bears a notation on its label stating "gland on back, anthers appendaged", but Churchill s.n., according to Bailey, has them "not appendaged". Lawrence reports that his P.584 has "anther connectives without gland."

MacDougal (1907) suggests that V. canadensis may hybridize in the wild with V. bracteata Lag. & Rodr., but he cites no examples, gives no description of the supposed hybrid, and does not say that he actually saw any such hybrid plants. Britton & Brown (1898 and 1913) make the same statement as a fact, but there are no such hybrid specimens in the Britton Herbarium at the New York Botanical Garden. I doubt very much whether these two species ever hybridize with each other, and certainly have never seen any specimens which could be regarded as such a hybrid.

Tharp s.n. [June 6, 1932] has massive inflorescences and the flowers exceptionally large. McBryde s.n. [5/15/31] is also anomalous in having large, thick, shallowly incised leaves, reminding one of V. tampensis Nash. The L. H. Bailey s.n. collections of June 30, 1919, July 4, 1919, July 23, 1925, August 7, 1925, July 22, 1926, August 15, 1926, September 8, 1926, and October 8, 1926, also have the leaves especially large and only shallowly lobed. Tracy 8707 looks somewhat like V. delticola, but apparently is not that species. Burk s.n. [Girard Point] is a mixture with V. bracteata, Palmer 11979 is a mixture with Agrimonia striata Michx., and Demaree 17004 is a mixture with Galium aparine L. The Everett & Quinn s.n. [N. Y. Bot. Gard. Cult. Plants R.41-36] is called the "red form" on its label, while Quinn s.n. [N. Y. Bot.

Gard. Cult. Plants R.38/36] is the "purple form". The Herb. Calif. Acad. Sci. 31446 does not actually say "cultivated" on its label, but I assume that it represents cultivated material. Croom s.n., from Florida, distributed as V. canadensis, is actually Phlox pilosa var. virens (Michx.) Wherry in the Polemoniaceae, while A. S. Hitchcock s.n. [Fowler, July 1, 1892], also distributed as this species, is Chamaesaracha conioides (Moric.) Britton in the Solanaceae. The verbenaceous portion of Demaree 17004 is anomalous -- it looks like a cross with V. bipinnatifida Nutt., but its corollas are smooth (not hairy, as in xV. oklahomensis Moldenke). Van Vleet s.n. [Mt. Sheridan, 7/4/03], however, is apparently a mixture with xV. oklahomensis. The parents of this hybrid were probably growing in close proximity to it, accounting for the mixture. Cain (1944) notes that from xV. wingei Moldenke (which is the cross between V. canadensis and V. tenuisecta Briq.) "it is possible to segregate both parents in pure form."

R. W. Pohl, in a letter to me dated December 27, 1951, says of V. canadensis: it "is found in this vicinity [Ames, Iowa] either as an escape or occasionally cultivated. It is very attractive and almost everblooming, and withstands the most outrageous soil conditions." The label on Winterringer 5331 bears this notation: "evidently trash had been dumped here". Hibbard 87 was first identified as V. bipinnatifida, then as V. bracteata, and finally as V. canadensis. Hitchcock & Stanford 6782 is very doubtfully this species.

V. canadensis was recorded by me in my "Known Geographic Distribution", edition 1, page 14 (1942) from Pima County, Arizona, but this record was based on Stiffler s.n. [1925] in the Cornell University herbarium, which has since proved to be V. gooddingii var. nepetifolia Tidestr.

The Edw. Palmer 247, cited below from Garvin County, Oklahoma, may actually have been from Atoka or Johnston Counties according to McVaugh (1956) who indicates that Torrey included Palmer's original nos. 260 and 390 in his "247" -- 260 was collected in Garvin County on June 11, while 390 was collected on July 1 either in Atoka or in Johnston County.

It is perhaps worth noting here that the specific epithet of this species is very often written with a capital initial letter, but this practice has no basis in Latin grammar nor justification under the present rules of nomenclature. Demaree apparently always writes the name of Hot Spring County, Arkansas, as "Hot Springs County". Bauer (1954) records V. canadensis from Fountain County, Indiana; Hebert (1934) from Berrien County, Michigan; Roads (1928) from Pike County, Ohio; Fernald (1936) from Princess Anne County, Virginia; C. N. Jones (1942) from Darke County, Ohio; and Deam, Yuncker, & Friesner (1952) from Blackford and Delaware Counties, Indiana. As yet I have seen no material from

these counties, but have no reason to doubt their records.

The reference to Loud., Hort. Brit. Suppl. 2: 680 (1839), given in the bibliography of this species, is often credited to W. Baxter, but apparently in error. The "Verbena grandiflora Ort." of Dermen, Cytologia 7: 161--163, fig. 7 (1936) is apparently an error for V. grandiflora Michx., since Ortega's name applies to a species of Priva that would hardly have been mistaken for a Verbena by Dermen.

Verbena canadensis is often attacked by the fungi Dicaeoma verbenicola Arth., Erysiphe cichoracearum DC., and Septoria verbenae Rob.

In the Linnean Herbarium, sheet number 7, under Buchnera, is labeled "Buchnera canadensis" in Linnaeus' own handwriting, while a note in pencil in Smith's handwriting says "V. Aubletia J. E. S." Sheet number 8 under Buchnera is labeled "obletia" in Linnaeus' handwriting and bears a supplementary note "Touretta" and an unidentified plate, with figures 1 to 7, pasted on it. Jackson does not know the source of this plate. The specimens in both cases are definitely Verbena canadensis. Schauer in A. DC., Prodr. 11: 554 (1847) credits the name Verbena aubletia to Linnaeus, but Linnaeus in the reference to which Schauer refers, Suppl. 86--87 (1781), plainly credits it to "Jacqu. hort. v. 2. p. 82. t. 176." It is interesting to note that at the end of his treatment of this species he says "Erinus peruvianus an hujus varietas?" Poiret (1808) cites Obletia Rozier, which he includes here, to "Journ. d'Hist. Nat. (1771)".

Verbena intermedia Penny is listed in the "Index Kewensis" with an "x", indicating hybrid origin. It is said by Don to be "intermediate between V. aubletia and V. lamberti Penny", but he certainly does not claim hybrid origin for it! The name Verbena drummondii Hort. is cited by me in Lundell, Fl. Texas 3 (1): 36, in syn. (1942), to "G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839", but the "Index Kewensis" affirms that W. Baxter was responsible for it there. The original description of V. aubletia var. drummondii Lindl. is simply "floribus lilacinis suaveolentibus."

Seed of V. canadensis is handled by many dealers, including Borsch, Cronamere, Poughkeepsie, Stumpp & Walter, Breck, and Weston, as well as Wayside Gardens of Mentor, Ohio, Gardenside Nurseries of Shelburne, Vermont, and W. H. Simpson of Birmingham, England. Vilmorin-Andrieux & Cie., in Paris, offer the drummondii form; Huntington offers grandiflora; Schling offers compacta; Sutton offers drummondii; while Haage & Schmidt in Erfurt, Germany offer atroviolacea, compacta, drummondii, and montana.

Vilmorin-Andrieux give the following cultural directions on their seed packets: "Semer: 1° en août-septembre en pépinière, en pots ou en terrines; repiquer en pots; hiverner sous châssis ou en serre tempérée au plus pres de la lumière; mettre en place en

fin avril-mai. -- 2° en mars-avril sur couche; repiquer en pépinière ou en pots, sur couche; mettre en place en mai (ou mai-juin). -- 3° en avril-mai en place ou en pépinière. -- Fl. de juin-juillet en octobre." The species has been in cultivation in England since at least 1799 according to Murray (1799).

Roig (1953) says: "La Verbena canadensis Britton, es muy empleada en los jardines para cubrir los canteros a manera de alfombras, y por la rapidez con se extiende y cubre el suelo muchos la denominan POBLADORA....En Santiago de las Vegas, y en otros pueblos de la provincia de La Habana....cultivada como ornamental en los jardines. Tiene las flores en umbelas de diversos colores." I have never seen any Cuban material of this species and am fairly certain that the plant referred to by Roig is xV. hybrida Voss.

Palmer (1916) cites his nos. 304 and 559 from Jasper County, Missouri. In his 1935 publication he says that the species inhabits "Prairies, fields, glades, and rocky slopes. Calciphile to circumneutral. General, but commonest in central and southern Mo." Schauer (1847) cites a Lindheimer s.n. from Texas, Douglas s.n. from Louisiana, Frank s.n. from Ohio, and Beyrich s.n., Fraser s.n., and Walter s.n. from "Carolina", all deposited in the Berlin and DeCandolle herbaria. He says "Forma vel varietas major, speciosior est V. Aubl. var. Drummondi Lindl.!....Planta ornamentaria hortis europaeis familiaris, ad affinibus foliis minus dissectis discernenda." Walpers (1845) classifies it in his Sect. Verbenaca, Subsect. Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia with ten other species. Schauer places it in his Sect. Glandularia.

Perry (1933) cites the following 104 additional specimens not as yet seen by me: NORTH CAROLINA: Vance Co.: Sturtevant s.n. [Kittrell, 11 April 1889] (E). SOUTH CAROLINA: Abbeville Co.: Hexamer & Maier s.n. [Abbeville District] (G). GEORGIA: County undetermined: Rugel s.n. [lower Georgia and middle Florida] (E). IOWA: Pottawattamie Co.: G. R. Vasey s.n. [Council Bluffs] (G). KENTUCKY: Shelby Co.: Flint s.n. [Shelbyville] (G). TENNESSEE: Rutherford Co.: Eggert s.n. [4 May 1898] (E). KANSAS: Cherokee Co.: A. S. Hitchcock 790 (E, G). Miami Co.: Rydberg & Imler 22 (E). MISSOURI: Barry Co.: E. J. Palmer 29804 (E). Carter Co.: B. F. Bush 318 (E). Henry Co.: A. S. Hitchcock s.n. [Windsor Springs, 30 May 1890] (E). Iron Co.: Drushel 2762 (E); Engelmann s.n. [Pilot Knob Creek, 9 Sept. 1859] (E), s.n. [Pilot Knob Creek, July 1867] (E); C. C. Epling 6134 (E); Greenman 3870 (E), 4076 (E). Jackson Co.: Broadbent s.n. [28 March 1864] (E); B. F. Bush 283 (E, G), 1933 (E), 2901 (E, G), 4922 (E), 6439 (E); Tindall s.n. [Independence, 1 June 1895] (E); Trelease 1161 (E). Jasper Co.: B. F. Bush s.n. [16 Aug. 1893] (E); E. J. Palmer 304 (E), 559 (E), 2996 (E). Jefferson Co.: Drushel 3659 (E); Eggert s.n. [Crystal City, 19 Aug. 1886] (E), s.n. [Crystal City, 6 May 1891]

(E, E); A. S. Hitchcock s.n. [Victoria, 10 May 1890] (E); Johnson s.n. [Kimmswick, 30 April 1905] (E); F. Wislizenus 285 (E). Madison Co.: Greenman s.n. [Mine La Motta, 19 May 1927] (E), s.n. [near Silvermine, 20 May 1927] (E). Phelps Co.: J. H. Kellogg s.n. [Jerome, 5 April 1914] (E). Saint Francois Co.: Trelease 714 (E). Shannon Co.: B. F. Bush 1168 (E). Stone Co.: E. J. Palmer 5682 (E), 24616 (E). Taney Co.: B. F. Bush 569 (E). Washington Co.: J. H. Kellogg 1958 (E). Saint Louis: Eggert s.n. [Allenton, 27 April 1887] (E), s.n. [16 May 1879] (E); Engelmann 334 (E); Sherff 333 (G). County undetermined: Eggert s.n. [Silica, 18 April 1896] (E); Greenman 4231 [Shot Hill, near Selma, 30 May 1923] (E). ARKANSAS: Carroll Co.: E. J. Palmer 29333 (E, G); Trelease s.n. [Eureka Springs, 19 April 1899] (E). Garland Co.: Trelease s.n. [Hot Springs, 31 Oct. 1899] (E). Hempstead Co.: E. J. Palmer 5407 (E). Hot Spring Co.: Letterman s.n. [Malvern] (E). Nevada Co.: B. F. Bush 545 (E). Sebastian Co.: Benke 4566 (G). County undetermined: Pitchard s.n. [Red River] (G). LOUISIANA: Avoyelles Par.: Hale s.n. (G). Cameron Par.: S. M. Tracy 8707 (E, G, N). East Feliciana Par.: Drummond s.n. [Jacksonville] (G). Natchitoches Par.: E. J. Palmer 7001 (E), 7071 (E). Webster Par.: Trelease s.n. [Minden, 15 April 1901] (E). COLORADO: County undetermined: G. R. Vasey s.n. [Rocky Mountains, lat. 40-51', 1868] (E, G). OKLAHOMA: Cleveland Co.: Emig 415 (E). Creek Co.: B. F. Bush 437 (E, G). Garvin Co.: G. W. Stevens 109 (E, G). LeFlore Co.: Blakeley 1471 (G). McCurtain Co.: Houghton 3643 (E, G). Muskogee Co.: E. J. Palmer 14283 (E). Ottawa Co.: G. W. Stevens 2340 (E, G). Payne Co.: Waugh 168 (E). TEXAS: Bowie Co.: Eggert s.n. [T. & C. Junction, 5 Sept. 1900] (E, G). Dallas Co.: Reverchon 740 (E), 2533 (E), s.n. [Dallas] (G). Galveston Co.: Van Huff s.n. [Galveston] (E). Grayson Co.: Reverchon s.n. [Denison, 15 March 1904] (E), s.n. [Denison, 22 April 1904] (E). Gregg Co.: Eggert s.n. [Longview, 21 April 1915] (E); E. J. Palmer 7124 (E). Harris Co.: G. L. Fisher 707 (W), s.n. [Houston] (E); E. Hall 435 (E); Lindheimer s.n. [Houston, Feb. 1842] (G). Houston Co.: E. J. Palmer 12056 (E); Tharp 838 (G). Liberty Co.: E. J. Palmer 11979 (E). Montgomery Co.: E. J. Palmer 33319 (E, G). Polk Co.: E. J. Palmer 5185 (E). She comments that "Verbena canadensis is one of the most easily recognized of the North American species belonging to the section Glandularia. It has a large corolla with the tube about twice as long as the calyx and, at maturity, an elongated spike with somewhat remote fruits and conspicuous calyx-teeth. The leaves are variously lobed or cleft. Although these variations have been used at sundry times to segregate species, they do not seem to be constant nor are they supported by definite geographic ranges, hence scarcely merit

recognition." The G. L. Fisher 707 which she cites is doubtless a typographic error for his no. 1707, cited below.

In all, 1183 herbarium specimens, including type material of most of the names involved, and 22 mounted photographs and illustrations have been examined by me.

Citations: CONNECTICUT: New London Co.: Jansson s.n. [East Lyme, July 8, 1931] (Go). NEW YORK: Suffolk Co.: John Jones s.n. [Bay Shore, May 4, 1951] (N). PENNSYLVANIA: Lancaster Co.: Tanger s.n. [June 4, 1938] (Up). Philadelphia Co.: I. Burk s.n. [Girard Point] (Up--17095). Washington Co.: Shafer s.n. [July 8, 1907] (Cm). VIRGINIA: James City Co.: Eggleston s.n. [Jamestown-Williamsburg, May 16-18, 1907] (Dt). County undetermined: Herb. Wallberg s.n. [1808] (Lu); Stebbins s.n. [Virgin.] (T). WEST VIRGINIA: Lewis Co.: West Va. Univ. Bot. Exped. 1651 (We, We). NORTH CAROLINA: Alamance Co.: Ahles & Bell 16928 (Hi--92858); Radford 10144 (Hi--92858). Brunswick Co.: C. R. Bell 11601 (Hi--121527). Cumberland Co.: M. G. Brooks s.n. [Fayetteville, April 7, 1940] (We). Orange Co.: F. Faust s.n. [10/25/37] (Hi--59470). Randolph Co.: Collector undesignated s.n. [June 30, 1891] (Hi--59460). Rutherford Co.: C. R. Bell 2109 (Hi--92956). Washington Co.: Radford 35194 (Hi--104886). SOUTH CAROLINA: Abbeville Co.: O. M. Freeman 5771 (Hi--92955); F. M. Hexamer 289 (Br); Radford 20026 (Hi--92954). Charleston Co.: K. Hunt 356a (It). Jasper Co.: Ahles & Haesloop 22295 (Hi--92851). McCormick Co.: Radford 20175 (Hi--92854). Orangeburg Co.: Ahles & Haesloop 21682 (Hi--146196). Spartanburg Co.: C. R. Bell 5696 (Hi--92957). GEORGIA: Clarke Co.: Barfield s.n. [May 8, 1917] (Gu--E.1042); Cleckler s.n. [April 10, 1917] (Gu--E.1041); K. M. Drewry s.n. [Apr. 16, 1929] (Gu--E.8541); Elrod s.n. [May 3, 1917] (Gu--E.1046); F. C. Garrett s.n. [May 3, 1917] (Gu--E.1043); C. B. Ingram s.n. [April 30, 1917] (Gu--E.1039); Miller & Maguire 1256 (Ba, Ua--16572), 1257 (Ua--16573), 1258 (Ba, Ua--16574); Palfrey s.n. [April 15, 1917] (Gu--E.1045); Pyron s.n. [Simpton's Bridge] (H--1652); J. M. Reade s.n. [April 22, 1911] (Gu--11746), s.n. [May 8, 1911] (Gu--E.1616); Thornton s.n. [May 3, 1917] (Gu--E.1040); A. C. Welch s.n. [May 13, 1917] (Gu--E.1047); Woodard s.n. [May 7, 1917] (Gu--11747). Dougherty Co.: Thorne & Muenscher 2475 (Ca--906198, N, Vi, W--1929830), 9198 (Vi). Hancock Co.: F. J. Hermann 10149 (N). Jackson Co.: Clausen & Trapido 3802 (Ba, N). Putnam Co.: Cronquist 4238 (Ca--789071, Gu--28028, N, T1, W--1927967); W. H. Duncan 4900 (N); Pyron & McVaugh 2396 (Gu--16648, H--52338). Randolph Co.: Thorne & Muenscher 7790 (Gu--30795). Richmond Co.: Cuthbert s.n. [Augusta, May 1897] (Fl--21104); L. DeWitte s.n. [Augusta, 1838] (M). Sumter Co.: Huger s.n. [Americus, Apr. 1897] (C); Lawrence & Moore 672 (Go). FLORIDA: Alachua Co.: Murrill 41 (W--

1846518), 421 (W--1928243), 422 (W--1928244); Van Hying s.n. [April 3, 1924] (Ob--50811), s.n. [May 2, 1924] (Ob--50763); G. F. Weber s.n. [Gainesville, 4-1-28] (Fl--20973, Fl--20974). Brevard Co.: A. A. Baldwin 70 (Up--17080). Broward Co.: G. L. Bates s.n. [Heath, Feb. 26, 1889] (Ur). Columbia Co.: Rolfs s.n. [Lake City, May 1893] (Fl--21133). Dixie Co.: Hume & West s.n. [Oldtown, 29 March 1936] (Fl--11466, Fl--20970). Duval Co.: T. Drummond s.n. [Jacksonville, 1833] (S); G. H. M. Lawrence 193 (N); Lighthipe 599 (N). Flagler Co.: E. West s.n. [Flagler Beach, 9-2-27] (Fl--20985); West & Arnold s.n. [Flagler Beach, 18 April 1940] (Fl--32354). Gadsden Co.: Alden s.n. [Fort King] (T). Highlands Co.: Brass 15267 (W--2065454). Jefferson Co.: R. K. Godfrey 54436 (Hi--155081, N); Lighthipe s.n. [Monticello, March 13, 1891] (Ur). Lee Co.: E. C. Marquand s.n. [March 4, 1930] (N). Leon Co.: R. K. Godfrey 54432 (Hi--155443, N). Marion Co.: J. D. Smith s.n. [Ocala, April 4, '79] (W--1323044). Saint Johns Co.: J. D. Smith 475 (W--1323047), s.n. [Mous Creek, April 15, '79] (W--1323046). Suwannee Co.: Exploration Party 1939 s.n. [17 Mar. 1939] (Fl--30166). Volusia Co.: Berkimer s.n. [Daytona, 3--22-'25] (Vt); S. A. Deam 1831 (Ur, W--753721); G. B. Grant 3063 (Po, Po--267663); A. S. Marsh s.n. [Deland, 1923] (W--1220068); B. H. Patterson s.n. [Daytona, Feb. 23, 1918] (Cm). County undetermined: Herb. Chapman s.n. [Florida] (C). ALABAMA: Jefferson Co.: Cooley, Harper, & Harper 4471 (T1); Harper & Morgan s.n. [March 22, 1941] (I). Madison Co.: R. M. Harper 3958 (N, W--1899147). Tuscaloosa Co.: Clausen & Clausen 5753 (N); R. M. Harper 3018 (Ba, Mi, N); E. A. Smith s.n. [Tuscaloosa, May 8, 1875] (W--876844); L. F. Ward s.n. [5 mi. above Tuscaloosa, April 11, 1892] (W--147558), s.n. [Tuscaloosa, April 1892] (Au--184936, W--255840). Wilcox Co.: Buckley s.n. [May 1840] (T), s.n. [May] (W--771877). County undetermined: R. C. Alexander s.n. [May 1841] (Ca--379994), s.n. [Sept. 1841] (Ca--379994); Buckley s.n. [May 1840] (Br), s.n. (Io--15339, Pr); Rugel s.n. [ad vias et in incultis arenosis, per Alabamam mediam, Sept. 1843] (W--2188142). MISSISSIPPI: Adams Co.: W. H. Rhoades s.n. [near Natches, July 1931] (N), s.n. [near Natches] (Hs). Jefferson Co.: McDougall 1293 (W--1925707). Oktibbeha Co.: S. M. Tracy 1659 (W). Pearl River Co.: Ashe s.n. [Apl. 18, 1931] (I). Pike Co.: F. S. Earle s.n. [McComb City, April 3, 1878] (Cm). County undetermined: Collector undesignated s.n. (N). OHIO: Clermont Co.: E. L. Braun s.n. [Milford, 5/4/12] (Cn), s.n. [Miamiville, 5/23/17] (Cn, Cn). Hamilton Co.: Aiken s.n. [May 13, 1905] (Po--267628); C. G. Lloyd s.n. [IV-23-05] (L1). ILLINOIS: Adams Co.: Brinker 3379 (Il--15854, Ur). Champaign Co.: Honeus s.n. [May 20, 1892] (Ur); L. A. MacGregor s.n.

[May 25, 1892] (Ur); Schwickrath s.n. [July 11, 1955] (Ur); Slimmer 33 (Ur). Cumberland Co.: Winterringer 5331 (Il--31872). Kane Co.: Springer s.n. [September 6, 1955] (Ur). Lawrence Co.: Sivert s.n. [May 8, 1949] (Ur). Menard Co.: E. Hall s.n. [1861] (Ur, W--1070016, W--1201443), s.n. [Athens, June 1866] (Ms). Peoria Co.: V. H. Chase 8710 (Ur), 14497 (Ur). Shelby Co.: G. D. Fuller 12713 (Il--19209, Il--19210). Union Co.: Ahles 3630 (Ur); F. S. Earle s.n. [Pine Hills] (Ur); G. D. Fuller 11630 (Il--19098, Il--19099, Il--19100); Winterringer 7059 (Il--35164). Vermilion Co.: R. Bell s.n. [June 9, 1948] (Ur). Wabash Co.: Schneck s.n. [April 13, 1880] (Ur), s.n. [May 1900] (Ur), s.n. [May 14, 1904] (Ur); Shearer s.n. [May 15, 1920] (Vi). INDIANA: Brown Co.: Lipps s.n. [June 14, 1942] (Ok). Clark Co.: J. F. Baird s.n. [8-4-78] (Mi). Howard Co.: Ek s.n. [near Greentown, 6-23-1936] (Bt--42530), s.n. [October 3, 1936] (Dm). Jennings Co.: C. C. Deam 24736 (Dm). Monroe Co.: Blatchley s.n. [May 7, 1887] (Dp). Orange Co.: Friesner 22735 (B). Putnam Co.: Yuncker 1380 (Dp). Wayne Co.: Creek s.n. [Nutter's cem., 8/4] (Ea). IOWA: Story Co.: W. W. Thompson s.n. [8 June 1951] (N); J. W. West s.n. [June 4, 1951] (Gg--406217). KENTUCKY: Edmondson Co.: Lix 363 (W--1948018). Fayette Co.: Didlake s.n. [Lexington, July 15, 1909] (W--592232). TENNESSEE: Davidson Co.: Dermon 12 (Hi--192179); G. W. Hubbard 1963 (Cm, In--9679, Ka, Vt); C. S. Williamson s.n. [Nashville] (N). Montgomery Co.: T. L. Andrews 151 (Io--32955). Rutherford Co.: Eggert s.n. [4 May 1898] (N); Gattinger s.n. [Cedar Glades] (Du--90902); Mortimer 38 (W--1814449); Quarterman 1638 (Va); Sharp & Shanks 439 [Herb. South. Appal. Bot. Club 110 & II.149] (Au, Au, Bt--65318, Dt, Gg--310876, I, N, N, N, Ok, Or--46592, Pl--153778, St--23810, We). Wilson Co.: C. C. Deam 61270 (Dm, N), 61351 (Dm); R. McVaugh 5560 (Ca--724961); F. H. Sargent 6119 (St). County undetermined: Gattinger s.n. [Cedarbottom, June '79] (Vt), s.n. [Middle Tenn., Aug. 1879] (Cm), s.n. [Cedar barrens] (Al). MICHIGAN: Cheboygan Co.: F. C. Gates 13773 (Ka--67941). Genesee Co.: Eggleston s.n. [Flint, 5-9-79] (Dt). MINNESOTA: Ramsey Co.: Eggert s.n. [St. Paul, 16 Mai 1879] (N). KANSAS: Anderson Co.: A. S. Hitchcock s.n. [Anderson Co., July 1896] (Ka); W. H. Horr s.n. [July 22, 1929] (Lw). Bourbon Co.: Kellerman s.n. [Fort Scott, July 15, 1887] (Ka); Z. D. Thompson 163 (Lw), 545 (Lw). Brown Co.: Mrs. O. Olson 2 (Ka--88181). Butler Co.: R. L. McGregor 4048 (Lw). Chautauqua Co.: A. S. Hitchcock s.n. [Chautauqua Co., Aug. 8, 1896] (Ka). Cherokee Co.: A. S. Hitchcock 790 (Ka, N, W--353581); A. A. Jacobs 50 (Ka--77569), 98 (Ka--74042); R. L. McGregor 15332 (W--2345456). Coffey Co.: Eilford s.n. [Sept. '98] (Ka). Cowley Co.: Clothier & Whitford s.n. [Aug. 22, 1897] (Ka); Ryd-

berg & Imler 508 (Lw); M. White s.n. [Apr. '98] (Ka). Crawford Co.: A. S. Hitchcock s.n. [Crawford Co., Aug. 1896] (Ka). Douglas Co.: Derr 40 (Ka); A. O. Garrett 8452 (Se--14963), s.n. [June] (Ob--50767); D. L. Marsh 1522 (Hi--198639, N); R. L. McGregor 31 (Lw, S), 14289 (Hi--198613, W--2327112); F. R. Schallert 4041 (H--5457); Snow 1963 (Lw). Edwards Co.: A. Finch 45 (Ka--80195). Elk Co.: Clothier & Whitford s.n. [Aug. 20 & 21, 1897] (Ka). Ellis Co.: C. S. Sheldon 323 (Al). Franklin Co.: W. E. Castle s.n. [April 10, 1890] (Ob--50768); A. S. Hitchcock s.n. [Franklin Co., July 1896] (Ka); Street s.n. [Princeton, May 19, 1919] (Po--63842). Greenwood Co.: Q. Gillett 36 (K); A. S. Hitchcock s.n. [Eureka, July 1892] (Ka); W. H. Horr s.n. [June 28, 1930] (Lw, Lw). Johnson Co.: W. H. Horr s.n. [Sept. 20, 1928] (Lw); Pellett s.n. [Summer, 1890] (Ka). Labette Co.: A. S. Hitchcock s.n. [Labette Co., Aug. 1896] (Ka); D. Nelson s.n. [May 3, 1924] (Ka--71452); Paull s.n. [Oswego, 5/29/1886] (Cm); Rydberg & Imler 323 (Lw), 379 (Lw, N); Schneck 97 (Ur). Linn Co.: B. F. Bush 15259 (Ka--89270), 15503 (Ka--89283); Clothier & Whitford s.n. [Aug. 9, 1897] (Ka); Gier 7956 (S). Miami Co.: Clothier & Whitford s.n. [Aug. 8, 1897] (Ka); Oyster s.n. [Spring, 1885; Herb. Prager 18629] (Gg--31445), s.n. [May 1886] (Ob--50771); Rydberg & Imler 22 (Ka--74645, Lw, N). Montgomery Co.: Bailey & Bailey 10234 (Ba); Clothier & Whitford s.n. [Aug. 19, 1897] (Ka); N. B. Jacobs 318 (Ka--92925); F. W. Johnson s.n. [Cherryvale, Sept. 16, 1900] (N). Morris Co.: Good 4 (Ka--91088), 25 (Ka--91087). Neosho Co.: Broadbent 22 (Ka); W. H. Horr s.n. [7/25/29] (Lw); Maus 1102 (Ka--72792, Ka--72793). Osage Co.: Z. D. E. Brown s.n. [July 28, 1896] (Ka); F. C. Gates 17317 (Ka--79799); R. L. McGregor 1561 (Lw). Riley Co.: Burtner s.n. [May 10] (Ka); F. C. Gates 12881 (Ka--72873, Ob--50775); Kellerman s.n. [Manhattan, May 18, 1884] (Ka); L. H. Pammel s.n. [Manhattan, May 15, 1927] (Ca--351348, Io--129735); J. F. Ross s.n. [May 15, 1899] (Ka); Walters s.n. [Manhattan, May 2, 1891] (W--222324). Shawnee Co.: Chamberlin 27 (Pl--35099); G. Hale 35 (Ka--78645); V. L. Harms 1379 (Hi--198497, N); Maus s.n. [Auburn, July 20, 1927] (Ka--72218); Pellett s.n. [Topeka, 1928] (Io--132834); F. R. Popenoe s.n. [Topeka, June 2, '80] (Pu). Wabaunsee Co.: A. S. Hitchcock s.n. [Wabaunsee Co., Aug. 23, 1896] (Ka); Maus 36 (Ka--72475), 239 (Ka--72679). Wilson Co.: Haller s.n. [Apr. 23, 1896] (Ka); W. H. Horr s.n. [July 12, 1930] (Lw). Woodson Co.: G. M. Clark s.n. [Batesville, Aug. 20, 1894] (Ka); M. Hale s.n. [1 May 1955] (We); W. H. Horr s.n. [7/11/30] (Lw); E. W. Lathrop 34 (W--2234918), 169 (W--2234972), 556 (N), 1028 (N), County undetermined: Herb. Hapeman s.n. (Hp); Herb. Kans. State Agr. Coll. s.n. [June 18, 1891] (C).

MISSOURI: Bates Co.: Broadhead s.n. [May 1871] (Cm). Boone Co.: Rickett 533 (Ok), s.n. [Bear Spring, April 23, 1927] (H--106468). Clay Co.: Broussard 22 (Je--5131); Gier 8106 (S); G. Moon s.n. [Liberty, 5/14/1940] (Je--3155). Greene Co.: Blankinship s.n. [26-4-79] (Io--34748), s.n. [Willard, July 20, 1919] (Po--63843); B. F. Bush 286a (Ca--25130); P. C. Standley 8367 (W--687327), 9171 (W--688089), s.n. [vicinity of Springfield, May 1905] (W--735592). Iron Co.: Churchill s.n. [Ironton, May 24, 1918] (Ba); J. A. Dru-shel s.n. [5/28/1916] (Ur); C. C. Epling 6134 (La, Or--20105, Or-20141). Jackson Co.: B. F. Bush 47 (Up--17079), 286 (C), 2901 (N, Ur), 4922 (W--606403), s.n. [4/9/1882] (Cn, Cn), s.n. [Courtney, 5-19-91] (C); K. K. Mackenzie 62 (Dm, I, N, S), 811 (N); C. A. Ripley s.n. [May 1890] (Ob--50764). Jasper Co.: Storm 24 (Ur). Jefferson Co.: Eggert s.n. [Crystal City, 19 Aug. 1886] (Cm, Du--123487); G. J. Goodman 962 (Ok); Goodman & Hitchcock 962 (Po--194454); Lloyd Williams 1468 (I). Johnson Co.: G. W. Stevens 4308 (N). Lafayette Co.: Bailey & Bailey 10284 (Ba). Lawrence Co.: W. Flint s.n. (Dt). Madison Co.: J. M. Greenman s.n. [Mine La Motta, 19 May 1927] (Mn--18638, N). Ozark Co.: B. F. Bush 13329 (Up). Phelps Co.: J. H. Kellogg s.n. [Jerome, Apr. 5, 1914] (N); E. C. Leonard 6592 (W--2164960). Saint Clair Co.: B. F. Bush 13298 (S), 13298a (Ka--84565). Saint Francois Co.: Ahles 2012 (Ur). Sainte Genevieve Co.: Brinker 1533 (I), 1638 (I); Koelling 31 (Ur). Saint Louis: H. N. Andrews Jr. s.n. [4/29/36] (Ms); Eggert s.n. [Stony hills, 16 May 1879] (Se--95715, W--518722); C. C. Epling 6412 (La); Herb. Hitchcock s.n. (Ka); Letterman s.n. [1.1.90] (N). Saint Louis Co.: Eggert s.n. [Allenton, 27 Apr. 1887] (Au, Ca--183199, Cm, Dm, Du--122872, Gg--31281, Io--79867, Mn--6888, Up--60737); Glatfelter s.n. [Allenton, 5-23-92] (Mi, W--308363); Letterman s.n. [Allenton, May 1888] (Ur); Ohlweiler s.n. [Allenton, 4-18-09] (Au); L. H. Pammel s.n. [Allenton, 5-1887] (Io--15338), s.n. [Valley Park, 5-1887] (Io--20748), s.n. [Glencoe, Apr. 22, '88] (Io--20747). Saline Co.: B. F. Bush 13439 (Au, S). Stone Co.: E. J. Palmer 5682 (Po--217515, W--1581050). Taney Co.: W. W. Eggleston 12240 (N, W--644250). Vernon Co.: Palmer & Stey-ermark 42162 (N, W--1604823). County undetermined: Collector un-designated s.n. [s.w. Mo., 7-89] (Pl--22610); Dapprich 1771 (Sm); James s.n. [near the Lead Mines of Missouri] (T); J. R. Lawrence s.n. [Apr. 7, 1929] (Ms); Letterman 41 (Po); F. Peck 1963 (Dt), s.n. [Missouri] (Pa). ARKANSAS: Baxter Co.: Demaree 28934 (N), 28944 (Hi--51455, Mi, N, Ok, We), 28971 (N, St). Benton Co.: Ev-ans & Morgan 26 (Ok); Heacox s.n. [July 4, '89] (Ob--50766); D. F. Morgan 15 (Ok); Plank s.n. [1899] (N). Bradley Co.: Demaree 24217 (Sm). Calhoun Co.: Demaree 14399 (I, N). Carroll Co.: Del-

linger, Moore, & Barkley 15008 (Au, N, N); A. Nelson 10859 (Du--230822, Um--54, Up); E. J. Palmer 29333 (N). Chicot Co.: Demaree 20933 (N, Sm). Cleburne Co.: Demaree 45072 (Ca). Conway Co.: Demaree 20916 (Ml, N, Sm), 37506 (Sm). Crawford Co.: Demaree 6411 (W--1437257); Shearer s.n. [Dyer, Aug. 28, 1919] (Vi). Drew Co.: Demaree 16566 (Du--256559, En, H--97668, N, Ok). Faulkner Co.: Demaree 5962 (St); F. C. Haas 1674 (W--1654393); Haas & Haas s.n. [April 7, 1934] (Dp). Franklin Co.: Demaree 20890 (N, Sm). Fulton Co.: Demaree 25864 (N). Garland Co.: Demaree 16683 (Du--256562, N, Ok, Se--69268). Grant Co.: D. Taylor s.n. [Grape Vine, 5/2/38] (N). Hempstead Co.: E. J. Palmer 5407 (Po--217508, W--1580971). Hot Spring Co.: Demaree 14301 (Gg--267603, N, Ok), 14878 (Ky, Ok, Pl--131513, Ur), 16734 (N), 16920 (Du--256566, Gg--267602, N, Ok), 16943 (Bt--52485, Io--152222, N, Ok), 17270 (N), 18830 (N, Sm), 18880 (N, Sm), 19020 (N, Sm); Letterman s.n. [Malvern] (W--985805). IZARD Co.: Demaree 17004, in part (Du--256565, Ok). Lawrence Co.: Demaree 25957 (N), 30449 (Au--121882, Hi--51437, Mi, N, Ok, We); Rolfs s.n. [8/91] (Io--44895). Logan Co.: Demaree 8110 (W--1582393), 22847 (Sm); Pyle 689 (Au); Mrs. H. S. Young s.n. [June 17, 1925] (Cm). Marion Co.: Demaree 29970 (N), 30110 (N), 31813 (Sm). Nevada Co.: J. P. Davis s.n. [24 April 1960] (Nb). Ouachita Co.: Demaree 16849 (Du--256563, N, Ok). Perry Co.: Welch 1205 (Dp). Polk Co.: Demaree 36603 (Sm, Z). Pope Co.: G. M. Merrill 202 (Il--15853, St--16757, Ur). Pulaski Co.: R. J. Bailey s.n. [April 17, 1937] (Cm); Demaree 18794 (N, Sm); H. E. Hasse s.n. [Little Rock, June 1886] (N); G. M. Merrill 1566 (Ur). Scott Co.: Demaree 18161 (N). Sebastian Co.: Bigelow s.n. [Fort Smith] (W), s.n. [9 miles w. of Fort Smith] (W); Demaree 18143 (N), 20881 (N, Sm). Sevier Co.: Brinkley 62 (Au, Au); Demaree 36578 (Sm, Sm). Sharp Co.: Demaree 26056 (Le). Washington Co.: L. H. Bailey 7565 (Ba); Fassett 17530 (Pl--76609); F. L. Harvey 18 (Cm); E. J. Turner s.n. [Greenland Township] (Au); E. M. Wells 3 (W--981703). Yell Co.: Demaree 20907 (N, Sm), 22777 (Sm); S. Watson s.n. [Mar. 28, 1931] (St--9242). County undetermined: F. L. Harvey 30 (C), s.n. (Ka); L. McLean s.n. [Blue Springs, 8-20-31] (St--14177); L. F. Ward s.n. [Arkansas, 1877] (W--155629), s.n. [Arkansas] (W--155946). LOUISIANA: Acadia Par.: E. Brainerd s.n. [Crowley, March 19, 1908] (Vt); Chambliss s.n. [Crowley, Apr. 5, 1916] (Tl); F. W. Pennell 10189 (N). Avoyelles Par.: Hale s.n. [Red River] (W--314317). Cameron Par.: Cocks s.n. [July 1903] (Tl); S. M. Tracy 8707 (Bm, Es, N, Tl, Tr, Up--50344, W--510599). East Baton Rouge Par.: Correll, Correll, & Brown 10393 (H--78934). Lincoln Par.: Bardin s.n. [Ruston, April 2, 1951] (Tl). Natchitoches Par.: Cocks s.n. [Mar. 15, 1911] (Tl), s.n. [Apr. 15, 1911] (Tl), s.n.

[Apr. 1914] (Tl); L. E. Fox 401 (Nc), 403 (Nc), 404 (Fx), 409 (Fx); E. J. Palmer 7001 (Gg--182240, W--1531581), 7071 (Gg--182149). Orleans Par.: T. Drummond 436 (Au--121796); J. Torrey s. n. (Br). Ouachita Par.: Kral 8404 (Hi--147840). Plaquemines Par.: Langlois s. n. [Febr. 1880] (Up--17077). Rapides Par.: Charette 571 (Vi); Small & Alexander s. n. [Sandhills near Lena, May 1931] (N). Saint Landry Par.: Biltmore Herb. 3655c (S). Saint Martin Par.: Langlois s. n. [8 March 1888] (I). Saint Mary Par.: Penfound s. n. [Cote Blanch Bay, 4/3/32] (Tl); Perkins & Hall 2623 (Po--256898); Rose-Innes & Warnock 701 (Au, N). Saint Tammany Par.: A-nect 20 (W--1036654, W--2261414); Arsène 11093 (W--1031525), 11982 (W--1033039). Tensas Par.: Ewan 19048 (Tl); Penfound s. n. [3-25-37] (Gu--19186, Tl). Terrebonne Par.: Arceneaux 290 (It). Union Par.: Cocks s. n. [Apr. 1913] (Tl). Winn Par.: Penfound s. n. [March 25, 1940] (Tl); N. F. Petersen s. n. [Winnfield, 4-13-12] (N). Parish undetermined: Hale s. n. [w. La.] (Pr); Herb. Hapeman s. n. (Hp); C. Peck s. n. (Ky); Penfound s. n. [Cote Blanch Bay, 4/3/32] (Tl); Short s. n. [Louisiana] (Cm, Ll, M, Pr); A. Wood s. n. [March] (Pa). COLORADO: Boulder Co.: Ramaley 15322 (Ok). County undetermined: G. R. Vasey 526 (Cn, Ms, Pa). NEBRASKA: Franklin Co.: Harper & Harper s. n. [July 24, 1897] (Io--133188). Furnas Co.: Lallman s. n. [May 20, 1936] (Bt--46800). OKLAHOMA: Adair Co.: M. Hopkins 3111 (Ok); C. S. Wallis 2859 (St), 6314 (Au--171251, St). Atoka Co.: Folsom s. n. [4-6-28] (Ok--10279); M. Hopkins 2821 (Ok), 2845 (N, Ok); Hopkins, Nelson, & Nelson 1080 (Ok), 1110 (Ok); Hopkins & Van Valkenburgh 4114 (Ok). Bryan Co.: W. S. Blain s. n. [Durant, April 20, 1934] (Bt--29694); C. S. Sheldon 26 (Al, Ob--97281, Se--14962, W--56206). Caddo Co.: Edw. Palmer 246 (T). Cherokee Co.: M. Hopkins 3904 (Ok); Little & Little 19 (Ok), 37 (Ok); W. C. Rhoades 49 (Ok); C. S. Wallis 6457 (St), 6664 (St). Choctaw Co.: H. R. Griffith 21 (St--20095); W. B. Hughes 25 (Au, Ok); J. R. McFarland 83 (Ok); Van Valkenburgh 56 (Ok). Cleveland Co.: F. A. Barkley s. n. [5/1/28] (Ok--10272); Emig 415 (W--643862); F. A. Herzog s. n. [Helsel, April 28, 1904] (Wi); Hibbard 87 (Ok--10288); Jeffs 49 (Ok--10283), s. n. [5/6/1921] (Ok--10310); Jeffs & Johnston s. n. [5-1-28] (Ok--10275); Kitchens 27 (Ok--20505); Mauk s. n. [Norman, 5/14/14] (Ok--20506); Quesenbery 18 (We). Coal Co.: Demaree 11976 (Ok--22229); S. Fry 133 (St--14009); Van Valkenburgh 16 (Ok, St--21428). Comanche Co.: M. K. Clemens 11750 (Gg--37139); Davy 186 (St--20238); Demaree 11957 (Au, Ca--84140, Ca--717794, N, Ok--22155, St--12971, W--1683779), 13168 (Ok--22148, St--12973); Ferguson, Buttram, & Buttram 67 (Ok); M. Gates s. n. [April 1, 1950] (Ok); Hopkins, Nelson, & Nelson 965 (Ok); D. McLean 275

(We); F. B. McMurry 657 (Ok); W. S. Myers 337 (Ok); E. L. Rice s. n. [April 23, 1938] (Ok); M. O. Rice 52 (Ok); Van Vleet s. n. [Mt. Sheridan, 7/4/03] (Du--172644, Ok--10269, W--1242502); Waterfall 2941 (Ca--882622, Ok). Craig Co.: Carleton 7 (Ka, Ur, Ur). Creek Co.: Bailey & Bailey 10220 (Ba); B. F. Bush 437 (C, Ok, W--217401); Schendel 33 (St--17917); Shimmers, Cottam, & Stephens 3577 (Ca--882617). Delaware Co.: Blevins 64 (St--18580); R. Goodner 44 (Ok); Reno 26 (Ob--68605); C. S. Wallis 2912 (St), 3769 (St). Garvin Co.: Edw. Palmer 247 (T); G. W. Stevens 109 (Du--65695, N, Ok, Ok, St--9243, Ur), A.115 (St--9245). Greer Co.: Hatchett 20 (St). Haskell Co.: Clark & DeVitt 26 (Ok); Zachritz 15 (St). Hughes Co.: H. Goodman 81 (Ok). Johnston Co.: M. Hopkins 4864 (Ok); Hopkins, Nelson, & Nelson 1024 (Ok). Kay Co.: Davy 79 (St--17575); M. B. George 4 (Ok); Randel 15 (Ok). Kingfisher Co.: L. A. Blankinship s. n. [Apr. 18, 1896] (Ob--50788). Latimer Co.: R. Bebb 8 (Ok); O. M. Clark s. n. [6/12/30] (Ok--10301); D. H. Dunn 19 (St--20073); M. Hopkins 1864 (Ok). LeFlore Co.: Blakley s. n. [G. W. Stevens 1471] (Ur); Demaree 12104 (N, Ok--22146, St--12972); G. J. Goodman 2525 (Ok); Hopkins & Cross 1528 (Ok); R. F. Mason 119 (Ok), 128 (Ok, Ok, St--14979), 138 (Ok, Ok), s. n. [April 12, 1937] (Ok), s. n. [April 17, 1937] (St--12970); P. M. Nelson 46 (Ok). Lincoln Co.: L. E. Rose 170 (St--19869). Mayes Co.: R. Bebb 2726 (Ok); O. M. Clark 3452 (B); Spears 78 (Ok, St--17564); Tripp 166 (St--9237), 167 (St--9238); C. S. Wallis 6678 (Au--171160); Waterfall 15292 (Go, Hi--193032, W--2331771); Wherry s. n. [Pryon, May 2, 1925] (Up). McClain Co.: Van Valkenburgh 1 (Ok). McCurtain Co.: Demaree 12053 (Ok--21772); Goodman & Barkley 2061 (Ok--17714); M. Hopkins 2865 (Ok); Hopkins & Cross 2503 (Ok); Hopkins & Pollock 6291 (Ok), 6302 (Ok); Houghton s. n. [G. W. Stevens 3643] (N, Ur); Little & Olmsted 271 (Ok--10305), s. n. [June 16, 1930] (Ok--10304); C. G. Ward 296 (St--16870). McIntosh Co.: E. Brainerd s. n. [Eufala, April 4, 1908] (Vt); Stratton 5080 (Ml, N, St--26149, St--26150). Murray Co.: Flowers s. n. [May 3, 1939] (Ok). Muskogee Co.: R. Bebb 3590 (Ok), 3816 (Ok), 3888 (Ok, Ok); E. L. Little 36 (Ok--10303), 1577 (Ok--10308), 1578 (Ok--10299), 1579 (Ok--10298), 1869 (Ok--10300), 2614 (Ok--10309); E. J. Palmer 14283 (B); W. Park 103 (Um--26); L. E. Rose s. n. [May 6, 1941] (St--19871); Turley 85 (Ok); C. S. Wallis 3791 (St), 6221 (Au--171257, St), 6462 (St). Okfuskee Co.: O. M. Clark 2387 (Ok--10302); Rey 14 (Ok, St--18078); M. Whitehead 26 (Or--41265). Oklahoma Co.: Harding 81 (St--17577); McLennan 88 (St--24887); Stemen 89 (Ok); Waterfall 2676 (Ok). Okmulgee Co.: D. Williams 18 (Ok). Osage Co.: O. H. Calvert 64 (St--23435); T. Johnson 115 (Ok), 118 (Ok); Liebenheim 49 (St); Perrin 100 (St--9234); Rice

137 (Ok); Sizemore 195 (St); G. W. Stevens 2048 (N, Ok), A.2048 (St--9259); Stout 18 (St--24202); Stratton 5095 (N, St--26151, St--26152). Ottawa Co.: Brensing 28 (Ok); Inkenberry 27 (St--18143); G. W. Stevens 2540 (Du--66385, N, Ok, Ok--21022, W--589900), A.2340 (St--9235); C. S. Wallis 3731 (St); M. C. Whaley 85 (Ok--10307). Pawnee Co.: Prewett 136 (Au). Payne Co.: Bogue 1364 (No--8609); C. O. Chambers s.n. [June 19, 1915] (St--9228); F. Clark s.n. (Id); Cowley 55 (Ok); Deonier 107 (Bt--48281); Divine 104 (Gg--267604); Felts 60 (St--9210); W. B. Hughes 30 (Ca--882621); C. D. Learn s.n. [May 1, 1915] (St--9226); Preston 93 (B1--42299); Rees 141 (Ok); O. C. Schultz s.n. [June 13, 1927] (St--9232); Stratton 236 (St--25124); Waterfall 104 (St); Waugh 168 (Ka, W--266913); A. D. West s.n. [April 18, 1959] (St). Pittsburg Co.: A. H. Brown 25 (Ok), 60 (Ok); M. J. Hall 26 (Ok); Hopkins & Cross 1638 (Ok); F. W. Pennell 10599 (N); E. Rogers s.n. [4-21-57] (St). Pontotoc Co.: D. McCoy 527 (St), 1288 (St), 2263 (St), 2282 (St), 2449 (St), 2481 (St); G. T. Robbins 2335 (Ca--903931); Van Valkenburgh 2 (Ok). Pottawatomie Co.: E. D. Barkley 27 (Ok--16762); Demaree 11969 (Ok--22231); Faulkner 28 (N), 30 (Ok); M. T. Jacobs 46 (Ok); P. J. White s.n. [Aug. 8, 1900] (Dm). Pushmataha Co.: Mehler 378 (W--2331708); Parkey 22 (Ok); Van Valkenburgh 51 (Ok); Waterfall 633 (Ok), 10550 (St), s.n. [Albion, June 3, 1937] (N). Rogers Co.: Waterfall 1456 (Ok). Seminole Co.: Demaree 11960 (Ok--20365). Sequoyah Co.: C. S. Wallis 3680 (St), 6223 (Au--171258, St). Tulsa Co.: P. V. Beck 156 (Ok), 187 (Ok); Burwell 42 (St--9236); C. Cameron 65 (Ok--10276); Constance s.n. [March 25, 1938] (Mn--32156). Wagoner Co.: R. Bebb 3935 (Ok), 3955 (Ok). Washington Co.: Rees 246 (Or--40101). County undetermined: Bailey & Bailey 10213 [Tals] (Ba); R. Bebb 2160 [Floral] (Ok); Butler 10629 [Indian Terr.] (In); L. Gould 59 (Ok--10274); J. A. Howard s.n. [April 21, 1935] (Ok--18242); W. S. Myers 337 [Wichita Mts.] (Ok); F. H. Rose 7 [Wichita Forest; Herb. U. S. Forest Serv. 42887] (Ca--445582); Mrs. O. St. John s.n. [Indian Territory] (Sd--4249); Sears 566 (Ok--10306); G. W. Stevens A. 1471 (Ok); Waterfall s.n. [Allison, 6/3/1937] (Ms). TEXAS: Anderson Co.: N. B. Furlong 38 (St); Lundell & Lundell 8478 (Ld, Mi, N); E. G. Marsh 1 (Au--121852); E. D. Schulz s.n. [Palestine, 1930] (Wi); Shinners 19260 (Ur); Tharp s.n. [Palestine, 4. 14.29] (Au, Au, Au, Mi). Angelina Co.: Hayden s.n. [Lufkin, 1917] (Io--100489). Austin Co.: H. Wurzlow s.n. [Industry, 1891] (Ur). Brazos Co.: Ness s.n. [1900; Reeves 200] (Cs), s.n. [3-28-1926] (Tr); Parks & Cory s.n. [College Station, 4-10-1927] (Tr). Burleson Co.: B. Martin s.n. [Lyons, 3.19.28] (Au). Caldwell Co.: Mc Bryde s.n. [5/15/31] (Nt). Cameron Co.: M. Cannon s.n. [February

9, 1927] (Mi, Mi); Cory 17932 (Tr), 17933 (Tr), 17934 (Tr), 17936 (Tr), 28307 (N); R. Runyon 2497 (N, N, N). Chambers Co.: Tharp 36006 (Au), s.n. [4/7--10/36] (Au, Au, Mi). Comal Co.: Thurrow s.n. [Spring Branch, April 29th, 1923] (Hu). Culberson Co.: Hitchcock & Stanford 6782 (N). Dallas Co.: Reverchon 2533 (N). Denton Co.: A. Nelson 10819 (Du--230823, S, Um--11, Up). Falls Co.: Lundell & Lundell 10101 (Ld, N, W--1888891); Whitehouse 19453 (Mi, N). Freestone Co.: Lundell & Lundell 10392 (Ld, N, W--1887659), 11004 (N). Galveston Co.: Mrs. A. F. Nelson s.n. [3-20-42] (Au). Grayson Co.: H. Gentry 122 (Au, N). Gregg Co.: E. J. Palmer 7124 (Gg--182148, W--1531810); C. L. York s.n. [3-20-38] (Au, Au, Gg--316097, N, Sm). Hardin Co.: Whitehouse 8748 (Au). Harris Co.: Biltmore Herb. 3655e (S); G. L. Fisher 33 (W--503107), 40 (W--1203310), 41 (W--1203311), 47 (W--1287656), 52 (Vi), 1707 (W--719766), 41041 (W--1825529), 49033 (Go), s.n. [Houston, March 31, 1912] (Ew), s.n. [Houston, Mar. 2, 1913] (Vi), s.n. [Houston, Apr. 3, 1913] (H--5465, Hp), s.n. [Houston, Apr. 3, 1915] (Du--172646, Mi), s.n. [Houston, Mar. 31, 1918] (Ca--882623), s.n. [Houston, Apr. 3, 1920] (Ur), s.n. [Houston, Apr. 22, 1923] (Hp), s.n. [Spring, May 4, 1924] (Du--172647, Ew, H--5473, Ur), s.n. [Mar. 17, 1930] (I), s.n. [Houston, March 25, 1938] (Gg--310875); Gaston 11 (Au); E. Hall 435, in part (N, Pa, Po--71257, Pr, W); Joor 64 (W--771876), s.n. [Harrisburg, August 10, 1875] (Mi); Lindheimer 137 (W--1870841), s.n. [near Houston, March 1842] (Sm); E. Meyer s.n. [Buffalo Bayou, Feb. 1844] (C).

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BOOK REVIEWS

Alma L. Moldenke

"Flowering Trees of the World for Tropics and Warm Climates", by Edwin A. Menninger; 335 pp., 425 color plates. Hearthside Press, N. Y. 1962. \$18.95

The author would have been most pleased with this review if it could have been rendered as a "play-back" of a tape recording of the "ahs", "ohs", and more articulate and laudatory comments of the botanically minded people, lovers of nature and appreciators of the beauty in color photograph and art who have given an almost worn-out look to the review copy of this book in our home! Instead, he and the publisher will have to settle for the written words of wholehearted approval and overwhelming appreciation of this tremendous task, very faithfully, accurately and magnificently presented.

Mr. Menninger states that "the purpose of this book is to put the finger on the flowering trees that somebody thinks are the